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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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CW Photo by B. Laberis

Sen. John Glenn last week blasted the Reagan administration's high-technology R&D policies when he charged that it is 'intent on strangling the goose that laid the golden egg' (story on Page 6). Meanwhile, the federal budget delivered to Congress last week asked a 17% increase in R&D outlays (Page 7).

Two Machines Round Off DG's 16-Bit Line

By Ed Scannell
CW Staff

WESTBORO, Mass. — In what could be interpreted as an attempt to distract its 16-bit customers' attention from the low-end 32-bit upgrades offered by competitors, Data General Corp. last week announced two versions of a high-end 16-bit system, one of which is said to be up to 150% faster than DG's Eclipse S/250.

One system, called the 200C, will be marketed through the firm's Small Business Systems Unit and is targeted as an upgrade for users of DG's 200B system. The other, dubbed the Eclipse S/280, is aimed at both industrial and scientific applications and is intended to serve as an upgrade path for users of DG's S/120 and S/140 processors. This version will reportedly be sold through the

(Continued on Page 2)

TI Bases Micro On 8088 Chip

By Ed Scannell
CW Staff

NEW YORK — Texas Instruments, Inc. last week announced its first microcomputer for business applications that does not incorporate a TI-manufactured microprocessor. One TI product manager described the announcement as a "market-driven decision."

Code-named Pegasus and officially called the Professional Computer, the system uses Intel Corp.'s 8088 16-bit microprocessor. The system can also be enhanced with a voice management system and "natural language" option, both announced last week, but which will not be available until the third quarter of this year, according to a TI spokesman.

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NAS Unveils 4341 Rivals; Drops 6100s

By Jeffry Beeler
CW West Coast Bureau

MOUNTAIN VIEW, Calif. — National Advanced Systems, Inc. last week restructured its medium-scale mainframe line by adding three processors that reportedly provide 20% greater price/performance than their nearest IBM equivalent, the 4341 Model Group 12.

NAS' just-announced Advanced System 6600 processor series replaces the company's AS/6100 medium-scale CPU family, which consisted of two models, the AS/6130 and the AS/6150.

Said to occupy less than half the floor space of the 4341-12, the AS/6600 family currently includes three IBM-compatible processors — the AS/6620, 6630 and 6650. The entry-level AS/6620 reportedly delivers roughly the same performance as the 4341-12 but costs 20% less. In contrast, the AS/6630 boasts 20% greater computing power than the IBM offering for about the same price.

The AS/6650, meanwhile, outperforms the 4341-12 by 60% but sells for approximately 33% more, according to an NAS spokesman.

NAS credits the AS/6600 line with providing a much broader performance range than the IBM-compatible mainframe family it succeeds. The AS/6620 reportedly offers about 10% more processing power than its AS/6100 counterpart, the AS/6130, and can be field-upgraded to the AS/6650, which supplies 30% to 40% greater DP horsepower than the AS/6100's high-end model, the AS/6150.

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Rather Than Total Communications Market

Fowler Says FCC to Deregulate Piecemeal

By Phil Hirsch
CW Washington Bureau

NEW ORLEANS — When the Federal Communications Commission does not find enough competition within a communications market to deregulate the entire market, it will deregulate individual services within that market, FCC Chairman Mark Fowler gave notice here last week.

High-speed data services were among those services mentioned as candidates for deregulation by Fowler when he delivered the keynote address at the Communication Networks Conference & Exposition.

Coverage of Comnet '83 continues on Pages 12 through 19.

Conference attendees found Fowler's statement especially significant because it expanded the scope of services deregulation generally thought to be contemplated under the commission's Second Computer Inquiry Decision.

The basic reason for deregulating the telecommunications marketplace is that "our society deserves the benefits [of advancing technology] . . . now," Fowler said, pointing out that "regulation, by its nature, embraces the status quo. It limits private incentive to innovate with new technology or, worse, discourages that innovation since new technology renders the embedded equipment obsolete."

In addition to high-speed data services, Fowler said, "the entire interexchange market is also a candidate" for deregulation.

Fowler indicated that another candidate is local exchange service, saying that "eventually and perhaps in

(Continued on Page 7)

Bank Coins Program to Identify, Retain Best DP Trainees

By Lois Paul
CW Staff

NEW YORK — It's an age-old problem, and Chemical Bank had to face it. How do you identify fast-track, high-potential DP trainees — and how do you retain them once they become full-fledged programmers?

Presented with that problem by its Systems Group in 1979, Chemical Bank's Technical Training Department began work four years ago on a screening and testing program to select the best candidates possible for a programmer trainee project. Turnover was high in the DP industry at that time; because figures of 25% to 30% were not unusual when the project was suggested, retention was a major focus of the program.

CW Photo by L. Paul

Chemical Bank knew that 'if we produced superstars who immediately left the bank, the [programmer training] program would be considered a failure,' observed George B. Taub.

"If we produced superstars who immediately left the bank, the program would be considered a failure," recalled George B. Taub, assistant treasurer of technical training.

The cornerstone of the screening effort was an aptitude test to screen applicants for the training program. Chemical Bank chose the Berger test from the Santa Monica, Calif., firm of Psychometrics, Inc. over the Wolfe test from Wolfe Computer Aptitude Testing, Ltd. of Montreal, primarily because Psychometrics supplied more information regarding the validity of its testing methods, Taub said.

According to Richard P. Halbrook, assistant secretary of Chemical Bank's research department, another factor in favor of the Berger test was that it allowed the bank to do its own analysis based on raw scores. The Wolfe test supplies a narrative analysis of the scores of each test taker.

Testing time was another consideration. The Wolfe test takes about 5½ hours, the Berger test approximately 2½ hours. Since Chemical Bank's recent test session involved 619 people, the difference was significant, Taub said.

During the third and most recent wave of testing and training, written invitations to apply for the program were mailed in November 1981 to 9,000 Chemical Bank employees. There was only one real criterion: They had to have been employed by the bank for a minimum of two years. Twelve hundred people responded to the invitations and, after a series of orientation sessions, 619 took the test; 81 passed.

The 81 who passed, along with six people who had taken the test previously and had asked to be reinterviewed, were scheduled for interviews. From those interviews emerged 41 qualified candidates for DP training, and training programs were

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IBM Puts SQL/DS Under VM/SP

RYE BROOK, N.Y. — IBM has announced a release of its Structured Query Language/Data System (SQL/DS) relational data base management system for large-scale IBM and plug-compatible mainframes running IBM's VM/SP operating system. The software also now supports those programming in Fortran in both VM and DOS environments.

SQL/DS previously ran only under DOS/VSE and the SSE/VSE operating systems, which were designed for small to medium-size processors. Release 2 is intended to bring SQL/DS into the end-user-oriented information center environment, which primarily is being used within installations running large-scale mainframes, IBM noted.

SQL/DS consists of a relational data base manager with an English-like query language for batch, interactive and on-line environments.

Within SQL/DS, data is organized into tables and is processed in sets concurrently, rather than one record at a time, the vendor explained. This is intended to reduce the number of required user commands.

Release 2 of SQL/DS will be available in September for a license fee of $376/mo.

DG Announces Two 16-Bit Machines

(Continued from Page 1)

company's Technical Products Group.

The 200C processor is suited for applications involving order entry, inventory and warehouse control, the company said. It is software-compatible with the other three members of the CS family as well as with the 32-bit MV line. The system runs under the Rdos and AOS operating systems.

Packaged 200C System

A packaged 200C system contains an Eclipse CPU; 512K bytes of memory, which can be upgraded to 2M bytes; a 50M-byte Winchester-type disk; a 1,600 bit/in. magnetic tape backup; a 16-line asynchronous terminal interface; dual-bay cabinet; Dasher D200 terminal; Rdos operating system; and right-to-use license.

The 200C system reportedly can handle an additional 638M bytes of Winchester-type disk storage in increments of 50M, 73M and 147M bytes. In addition, the company claimed it has improved the reliability of the system's memory through a continuous error checking and correction feature that corrects single bit errors in memory.

The S/280, which is primarily aimed at the scientific marketplace and can be fitted with an optional floating-point processor, was designed to compete against the 32-bit machines offered by such firms as Digital Equipment Corp. and Perkin-Elmer Corp. According to S/280 product manager Aug Brown, the system's performance is said to equal that of DEC's VAX-11/750 32-bit superminicomputer.

Reasons Why

When asked why DG decided to pit another 16-bit system against competitors' 32-bit machines, Brown replied, "What we are doing is making a statement to our 16-bit customers that this is the next step in the development of our 16-bit line."

Brown said the applications best suited for S/280 include computer-aided design and manufacturing, process control and test equipment.

When used with an optional floating-point processor, the S/280 reportedly has a 900K-Whetstone rating, which the company claimed is faster than "most mid-level 32-bit minicomputers." In addition to the floating-point processor, the company attributes the S/280's improved speed to the microprogrammed CPU's use of bit-slice technology, an on-board 4K-byte memory system cache, the use of third-generation bipolar components and the burst multiplexer channel that allows high-speed peripherals to transfer information in and out of main memory in bursts of 13.3M byte/sec and 9.7M byte/sec, respectively.

The S/280 is compatible with three of the company's operating systems: MP/AOS, which allows programs to be transported to smaller Eclipse systems; AOS, which increases the system's multiuser capabilities; and Rdos, which allows the system to be used in both real-time and batch environments.

A typical S/280 configuration containing 512K bytes of memory, upgradable to 2M bytes; the floating-point unit; a 25M-byte Winchester-type disk; integral quad floppy; operating system; and language entitlements costs $46,220. In its basic configuration, which includes just the CPU and 512K bytes of memory, the system is priced at $30,000.

A packaged 200C computer system and right-to-use language license lists for $57,130.

Both systems will be available 90 days after receipt of order, DG said from 4400 Computer Drive, Westboro, Mass. 01580.

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* * * *

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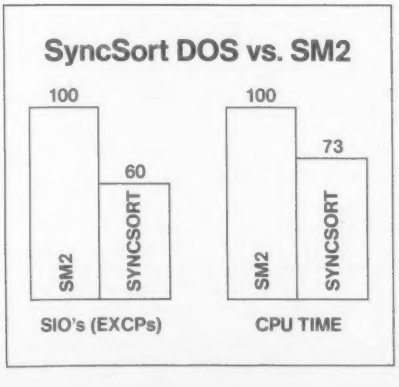

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Eleven User Suits Slam Northrop Data Systems

By Paul Gillin
CW Staff

The first 11 of what may eventually total 27 lawsuits seeking $405 million have been filed against the now-defunct Northrop Data Systems, Inc. (NDSI) and its parent company, Northrop Corp. The suits charge that NDSI misrepresented the capabilities of the packaged minicomputer systems it sold between 1976 and 1980 and then failed to provide adequate support when numerous and severe problems appeared.

The suits involve the Northrop Interactive Medical System (Nims), the New Group System — both for small medical offices — and the Standard Upholstery Furniture Manufacturing System for small manufacturers of furniture. Northrop could not be reached for comment about the suits.

Ronald C. Stock of Pastrana & Stock in Westminster, Calif., the law firm filing the suits, contended that NDSI knew of serious flaws in the Nims software when it began marketing the system in 1976 and that NDSI released the New Group System without field-testing it.

According to Stock, operating system software defects frequently misdirected and destroyed data. Software traps inexplicably shut down the systems and offered cryptic error messages that could not be deciphered by operators, he charged. Stock further claimed that self-purging features built into the New Group System regularly purged the wrong accounts.

The attorney also contended that NDSI programmed the systems in assembler code and then provided inadequate documentation when the company folded. "The customers were left essentially high and dry," Stock said.

The first suit — Colima Internal Medical Group, Inc. vs. Northrop Corp. and NDSI — is scheduled to go to trial in May. However, the courts must first decide whether the suit can be filed against Northrop or only against its NDSI subsidiary, which has been inactive since late 1980. Hearings were scheduled last Thursday in Los Angeles Superior Court on summary judgments made by both sides.

Northrop, based in Whittier, Calif., has entered a $1 million letter of credit from the Bank of America as a good-faith guarantee to pay for any judgment against it in the Colima case. Northrop is arguing that NDSI was an independent business and that the corporation's liability is limited in claims against its former subsidiary.

However, Stock said he will produce evidence that NDSI was a veil for the parent corporation and that Northrop is liable for the computer company's debts. "Any judgment against NDSI is essentially worthless. We believe they have no assets and no income. To get a judgment against NDSI would be futile."

Stock said his firm will base its argument partially on the sales pitch NDSI used to use to sell its systems. That strategy emphasized that customers could trust NDSI products because of the financial stability offered by Northrop, he said.

Settled by Arbitration

The suits come on the heels of a December judgment by the American Arbitration Association, which awarded $87,000 to Maryland Orthopaedic Clinic, Inc., now the Center for Pain Management and Orthopaedic Surgery, in a dispute with NDSI and Northrop. In denying a counterclaim by NDSI, the three-member tribunal ruled that Northrop was "the entity that owns and controls NDSI and [is] the real party in interest."

Stock said that although the tribunal's decision is in line with his arguments, the arbitration judgment does not set a precedent for a court suit. The standard contract provided by NDSI included provisions for binding arbitration in the event of a dispute. However, arbitration does not provide for punitive damages.

"We would like to get large punitive damage awards on the basis of what we consider to be outrageous conduct," Stock said.

The award in the Maryland Orthopaedic case represented the costs of purchase and maintenance for a New Group System bought by the clinic in August 1979. Attorney John T. Westermeier, a partner in the Washington, D.C., law firm of Abrams, Kovacs, Westermeier & Goldberg, said NDSI made numerous modifications to the system installed at the Maryland clinic, but failed to supply documentation for the changes when the computer company went out of business.

"The system was basically useless and eventually obsoleted," Westermeier said.

Northrop Users Detail System Woes

By Paul Gillin
CW Staff

One patient stopped in for an $18 treatment and received a bill for $35,000. A user generated a standard monthly report and found that $6 million had mysteriously been added to his firm's general ledger. And in a third case, $10,000 worth of receivables were found to be missing only days after the New Group System from Northrop Data Systems, Inc. (NDSI) was installed.

Such were the stories told to *Computerworld* by disgruntled users of medical practice systems sold by NDSI between 1976 and 1980. Two of the users are parties in a series of lawsuits that are being filed against Northrop Corp. and its former NDSI subsidiary. The suits are expected to seek over $400 million in damages.

Thomas Stearns of the Nashville (Tenn.) Orthopaedic Association, who is president of the Northrop Data Systems Users Group, has "perhaps 1,000" letters of complaint from NDSI users. "Those of us who bought systems early were able to get them up and working before things really began to fall apart," said Stearns, who is not participating in the lawsuits. "But those who bought just before NDSI went out of business [in 1980] have simply been tossed around from one service organization to another."

Dr. Richard Houghton, vice-president of the Allergy Pediatrics Medical Group, Inc. in Huntington Beach, Calif., said his company looked at several medical systems before buying an NDSI package for $80,000 in September 1977. "We felt it could handle our needs at the time plus our growth plans from four to six doctors. One thing that encouraged us was NDSI's promise that we'd have no software expenses, that they would make improvements as the customers required them," Houghton said.

Problems Obvious

However, problems were obvious the day the system went on-line, Houghton said. "After we transferred from the ledger cards to the system, the accounts receivable were off $10,000," he said. "Finally they found $5,000, but they never found the rest.

"We could never get the accounts to balance," Houghton claimed. "We continued to come out $100, $150 and $500 off in our accounts receivable. We would put fees in for the day and never be sure we were getting them in."

In the spring of 1979 the system shut down for 10 days, and Houghton had to borrow $10,000 to meet his payroll. "Finally they got the computer up again and suddenly the system that was supposed to last us a lifetime was full of data. I could not add a fifth doctor. I had to spend $21,000 to buy another disk drive," Houghton said.

A disenchanted Houghton began writing a newsletter for other NDSI users in 1978 and convened a West Coast users meeting in May of that year. "I just figured people locally would come," he said, "but I got calls from all over the country. We had 150 people show up." The organization joined with the national users group and Houghton was charged with finding an attorney. "I am the impetus behind this suit," he said.

Allergy Pediatrics continues to operate with two sets of books and is in the process of shutting down the computer to return to full manual accounting. "We are using an independent vendor for software support," he said. "The system is up, it's running, but it's too expensive to maintain."

Similar experiences were reported by the administrator of a Southeastern orthopedics practice, who asked not to be identified. "We almost bought an IBM [minicomputer system] because of the name, but went with Northrop because they expressed themselves as specialists in the field with the backing of Northrop Corp.," she said.

Problems From Day One

The firm bought the NDSI package in July 1978. "We had problems from day one. A $6 million item appeared in general ledger/accounts payable and we don't know where it came from," she said. "Some programs never worked. Our accounts receivable consistently were from $20 to $1,500 off."

The administrator said a programmer from Kalbro Corp., which assumed software support for NDSI systems in January 1981, analyzed the system and "found that 95% of our problems were system errors. He said it would cost $150,000 to get the system up again, and that was with a discount." The system originally cost $100,000.

The firm shut down the NDSI system in January 1982 and bought a Point 4 Data Corp. minicomputer with off-the-shelf software customized by an independent contractor. "It is a beautiful and smooth system," she said. "But we're still paying for the old computer. We took out a seven-year contract in 1978."

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Harris Poised to Unveil Modular 32-Bit Machine

By Susan Blakeney
CW Staff

FORT LAUDERDALE, Fla. — Harris Corp. is expected to expand its superminicomputer line this week when it unveils a machine that features modular expandability as well as the company's Integrated Memory Subsystem, announced last month. The system and some of its peripherals are packaged in a single cabinet, a Harris spokesman noted.

Designed for general business, scientific and engineering applications, the H700, slated to make its debut this week, reportedly handles multiple concurrent functions such as real-time processing, interactive and time-sharing applications, multistream batch and multiple remote job entry processing.

Like the H800 superminis announced at the same time as the Integrated Memory Subsystem [CW, Jan. 10], the H700 is intended to compete against Digital Equipment Corp.'s VAX-11 and other machines in the mid-range supermini marketplace. The H700 with optional cache memory, for example, boasts 75% to 80% of the performance of the VAX-11/780 at a savings of $60,000 to $75,000, the Harris spokesman claimed.

Basic components of this system include extended addressing features and the newly developed Integrated Memory Subsystem. Options include the cache memory performance enhancement and a floating-point processor.

The Integated Memory Subsystem allows the H700 to support up to 12M bytes of physical memory and offers up to 48M bytes of hardware-implemented virtual memory, the Harris spokesman said. Available in 384K-byte, 768K-byte or 1.5M-byte increments, it is capable of handling program sizes up to 6M bytes and up to six ports of shared memory, the spokesman noted.

The cache reportedly enables the H700 to support up to 128 terminals.

Also available with the H700 are the company's Integrated Disk Controller and Communications Network Processor (CNP). The former reportedly combines the I/O channel and disk controller functions on one board and supports up to four disks. The latter is a single board that simultaneously supports up to 16 individually programmable communications lines for local or remote device connection via synchronous, asynchronous, isosynchronous and X.25 protocols. The operator's console port is also on the CNP.

The H700 system is built to fit in one cabinet that houses the CPU, disk drive and magnetic tape unit. It is supplied with a 22-slot CPU chassis with 18 slots for CPU, memory and I/O; the remaining four slots are dedicated to the floating-point processor option.

Prices for the H700 series begin at $49,900. Shipments are slated for the second quarter of this year. Further details can be obtained from Harris at 2101 W. Cypress Creek Road, P.O. Box 6200, Fort Lauderdale, Fla. 33310.

Corrections

In "U.S. Not Alone in Software Expertise: Futurist" [CW, Jan. 31], Charles P. Lecht cited reports of Nippon Electric Co. plans to shoot a fully automated chip-producing factory into Earth orbit by 1987. The company should have been identified as Nippon Telephone and Telegraph.

Control Data Corp.'s Cyber 815, a recently announced megamini that was developed by CDC Ltd. of Mississauga, Ont. ["CDC Ups Cyber Line, Cuts Memory Prices," CW, Jan. 24], has actually been available in the U.S. since November.

Burroughs Small Business Line Capped by 64K-Bit Machine

DETROIT — Burroughs Corp. last week unveiled a high-end addition to its B90 series of small business systems.

The B96, the first B90 to employ 64K-bit chip technology, reportedly offers three times the memory capacity and 30% more disk storage than earlier B90s. It is also said to occupy 40% less floor space than its predecessors.

The B96 is aimed at first-time users of stand-alone systems as well as larger organizations with distributed processing or networking applications.

Available with 512K to 1.5M bytes of main memory, the B96 can support up to 231.6M bytes of disk storage. The machine comes with Burroughs' CMS operating system and features Superstart, the newly announced menu management package.

The system can communicate through up to four data communications channels using either asynchronous or synchronous/bisynchronous transmission modes over leased or switched lines. With a Data Comm Power Pak, the B96 can support transmission rates up to 60K bit/sec, Burroughs said.

A typical B96 configuration costs $38,000. Burroughs is headquartered in Detroit, Mich. 48232.

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Glenn Assails Reagan's High-Tech R&D Policies

By Bill Laberis
CW Staff

WASHINGTON, D.C. — John Glenn — senator, astronaut and possible presidential candidate — took off the gloves last week and shot some bare-fisted jabs at the Reagan administration's research and development policies relating to high technology.

Claiming the administration is "intent on strangling the goose that laid the golden egg," Glenn charged that Reagan-engineered budget cuts have savaged government-sponsored research with a "sharp and unrelenting attack."

The Ohio Democrat made the remarks in his keynote address at a conference here last week on "High Technology Industries Public Policies for the 1980s." The conference was sponsored by Government Research Corp. and a group of industry organizations, including the Computer Business Equipment Manufacturers Association, Electronics Industries Association and Semiconductor Industry Association.

Vital to U.S. Posture

Like several other speakers at the conference, Glenn extolled government-funded research in electronics, saying such research is vital to the economic and military posture of the U.S. in the future. But, in what may be a harbinger of campaign rhetoric to come, Glenn made it clear he believes that the Reagan administration's budget initiatives, as well as its attitude toward basic research, carry national implications that are "deadly serious."

Yet Reagan, speaking before a group of electronics executives two weeks ago in Massachusetts, said his fiscal 1984 budget proposal contains "unprecedented increases" in government-sponsored research [CW, Jan. 31].

"While we mistakenly try to trim our budget deficits by taking a machete to our research commitments, our competitors are moving in the opposite direction," Glenn said, alluding to ongoing government-aided research efforts in Japan.

Japanese R&D Increasing

Glenn claimed that, in terms of gross national product, Japan as a nation will increase its research investment by a third over the next seven years, an effort fueled by a 50% increase in government supports for research.

Pointing to Japan's National Superspeed Computer Project and Fifth Generation Project, Glenn hinted that one area into which the U.S. government might channel research funds is supercomputer development. The senator said that the fruits of such research will have direct military and weapons systems applications.

"Whether we speak of America's military preparedness or her industrial strength, we simply cannot afford to become dependent on computers that are manufactured abroad," he said.

Attacking Education Cuts

Glenn also seized the opportunity to attack the administration's education cuts for student and faculty support, terming the president's response to a purported shortage of engineering graduates "frightening."

"First they cut virtually all funds for science education from the budget of the National Science Foundation [NSF]," Glenn said of administration cuts. "Then they tried to dismantle the NSF's Science Education Division. And then they appointed a Commission of Precollege Science and Math Education to tell us what to do about the problem they exacerbated. That's almost like the child who murdered his parents and then asked the court for mercy because he was an orphan," the senator said.

Not to be outdone by administration initiatives, Glenn proposed his own six-point program "to recapture America's technological superiority." His program includes restoration of government funding for research programs with high potential payoffs, rebuilding the NSF's education program and making the recently enacted R&D tax incentives a permanent fixture of the tax code.

NAS Brings Out 4341 Rivals

(Continued from Page 1)

The AS/6650 has no exact equivalent in the IBM mainframe world, an NAS official said. Users who outgrow the capabilities of the 4341 series have little choice but to migrate all the way from the 4341-12 to an entirely different IBM product line, the 3083. The AS/6650, therefore, fills a performance gap that the industry giant's medium-scale mainframes have yet to address, according to NAS.

Reduced Operation Costs

NAS also credits the AS/6600 family with costing less to operate than the AS/6100. The AS/6600's reductions in heat dissipation, power consumption, air-conditioning requirements and maintenance costs are attributable to increased densities in the mainframe line's semiconductor circuitry, which includes 1,500 gate/chip logic components and 64K-bit memory devices.

With the AS/6600 series' introduction, NAS' IBM-compatible processor spectrum now encompasses four main lines, the other three being the AS/5000, AS/7000 and AS/9000. As its name suggests, the AS/6600 falls somewhere between the AS/5000 and 7000 families in processing power.

All three members of the AS/6600 series require at least 4M bytes of main memory expandable in 4M-byte increments to a maximum of 16M bytes. In addition, both the AS/6620 and AS/6630 support five to eight channels, unlike the AS/6650, which accommodates five to 10 channels.

With the AS/6600's two smallest members, up to six channels can be of the block multiplexer variety, all capable of supporting the data streaming protocol. The AS/6650, by contrast, can be configured with up to eight such channels.

As many as five of the AS/6650's channels can transfer at 3M byte/sec, whereas up to four of the AS/6620's and 6630's channels can operate at the same rate.

Among their other features, the AS/6600 machines come with an optional high-speed arithmetic unit that reportedly speeds the execution of scientific and engineering instructions by 30% to 40%. Implemented in microcode, the unit is unavailable with IBM's 4341-12, NAS said.

Both the AS/6620 and 6630 boast a 60-nsec machine cycle and a 420-nsec read-write memory cycle, compared with 50 nsec and 350 nsec, respectively, for the 6650.

A 4M-byte, five-channel AS/6620 system costs $370,000, compared with $465,000 for a similarly configured 6630 and $580,000 for a basic 6650. All three mainframes will be available for shipment during the third quarter from NAS at 800 E. Middlefield Road, Mountain View, Calif. 94042.

NAS Stops Making CPUs

MOUNTAIN VIEW, Calif. — With the elimination of the AS/6130 and AS/6150 processors from its processor lineup, National Advanced Systems Corp. (NAS) ended all its domestic manufacturing of computer systems. Henceforth, the firm will buy all of its system hardware from Japan's Hitachi, Ltd., whose mainframes are already marketed by NAS in the U.S.

NAS decided it is more economical to buy Hitachi processors than to continue manufacturing machines within the U.S., an NAS spokesman said last week. The firm shut down most of its San Diego manufacturing facility last Monday, eliminating about 400 employees' jobs. About 70 to 80 employees will remain at the facility to provide hardware, software and engineering support to NAS users.

NAS will continue to make software and microcode modifications to Hitachi systems in order to make those processors compatible with IBM systems software, the spokesman explained. The firm will also continue to produce memory enhancements.

NAS began phasing out its domestic manufacturing in the late 1970s, when it started to buy processors from Hitachi. NAS' AS/7000 and AS/9000 processors are also manufactured by Hitachi, but older processors (the AS/3000 and AS/5000 lines) were manufactured domestically.

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Reagan Budget Asks 17% Increase for R&D

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Reflecting the White House's new enthusiasm for basic research and scientific education in this country, President Reagan's fiscal 1984 budget, delivered to Congress last week, calls for a 17% increase in federal research and development outlays.

Total federal support for R&D, including research facilities, was set at $47 billion, an increase of $6.9 billion over the 1983 level of $40.1 billion. This overall figure includes a 10% increase for the conduct of basic research, from $6 billion in 1983 to $6.6 billion in the next fiscal year, allowing a 4% real growth in this category. The $6.6 billion includes an 18% hike in National Science Foundation (NSF) programs.

Describing the administration's R&D philosophy as seeking "to complement private-sector efforts," the budget document stated that "the federal government's role is primarily to create an economic climate conducive to private investments through such measures as tax incentives and reductions in the burden of regulations.

"Federal government investments should be limited to longer term research and technology support, which the private sector does not have the economic incentive to provide for adequately to serve the national interest," the document said.

The administration said it will try to make better use of the increased research funds to attract high-caliber scientists and engineers, particularly young faculty members, into research; "encourage greater and more effective interaction among university, government and industry scientists; and upgrade the technical facilities of universities to enhance R&D productivity and train scientists and engineers."

Turning to budget details for NSF, which supports R&D in universities and research facilities, the fiscal 1984 federal budget would provide $1.2 billion for R&D, an increase of $180 million or 17% above the 1983 level, for an inflation-adjusted increase of 12%.

Within this category NSF support for basic research would grow by about 18%, specifically targeting programs that include R&D in computer engineering. It would also provide $180 million, an increase of 61% over 1983 outlays, for upgrading technical facilities at universities.

Looking at two NSF programs that support R&D in electronics and computer sciences, the agency's mathematics and physical sciences program would receive $364.3 million in fiscal 1984, compared with $299.7 million in 1983. And the engineering program would have its funding increased from $100.8 million to $123 million.

In order to promote better precollege mathematics and science education, the relevant NSF program would realize a 33.3% hike in funds, from $15 million in fiscal 1983 to $20 million in fiscal 1984. This program awards funds for instructional programs and training activities to colleges and universities.

Fowler Eyes Deregulation

(Continued from Page 1)

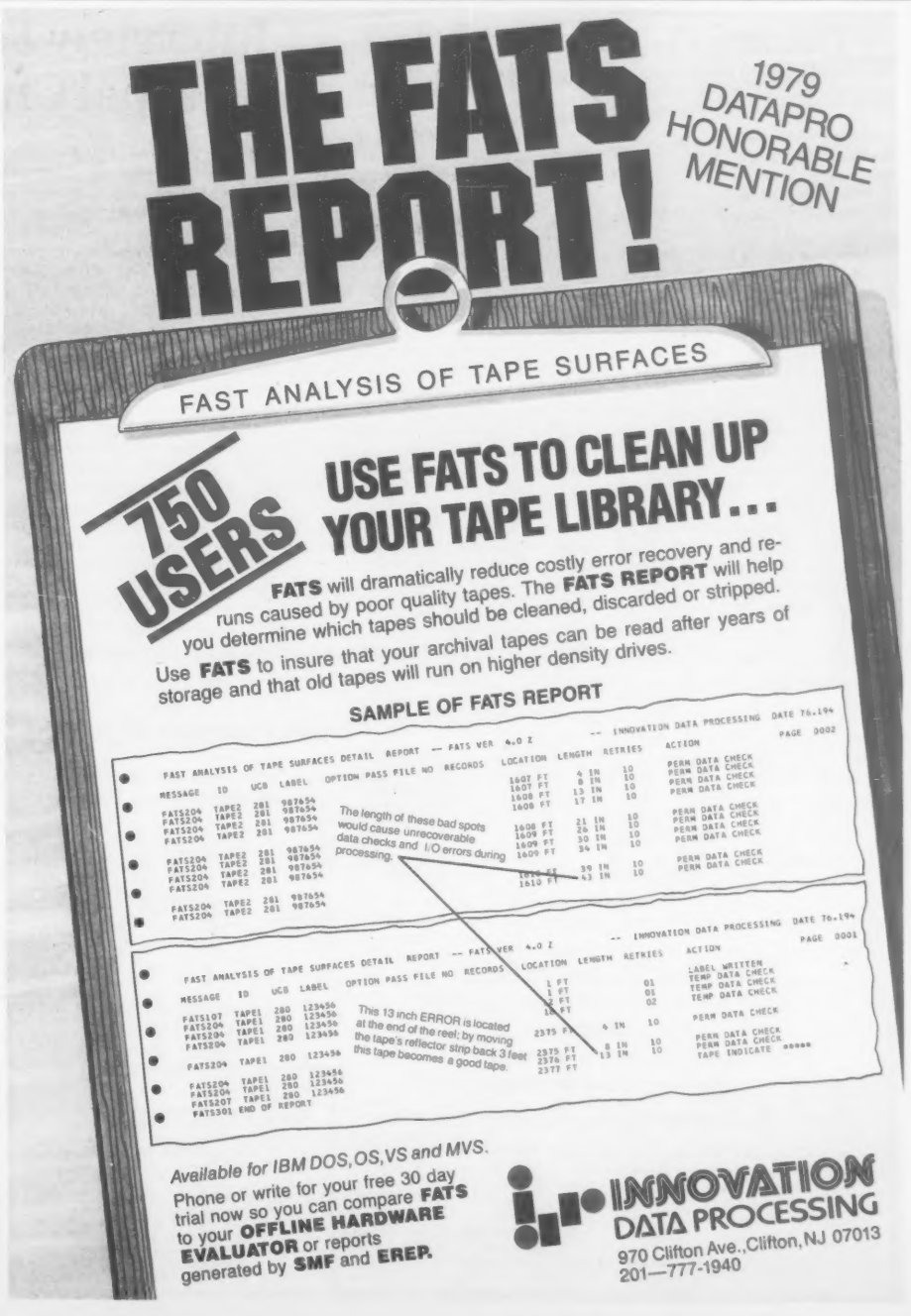
the not-too-distant future, competition . . . may come to the local loop. Cellular radio, cable systems, narrow beams, single sideband and satellites are only the beginning of competing local pathways. It is even within the realm of possibility that distributed central offices could disappear, with centralized switching done within the telephone instrument itself or through fast but dumb switching devices in satellites."

During his presentation, entitled "Regulation-Free Telecommunications: A Blueprint," Fowler made it clear that competition is the ultimate goal of present FCC policy. While the FCC still has a long way to go, "we have a compass and a map. Our compass is 'unregulation.' Our map is to free up incrementally selected markets and participants within those markets until the necessity for regulation's surrogate function is displaced by the primary regulator — the consumer."

While Fowler did not say how long the "unregulation" process would take or what steps the FCC would take to accomplish it, he did give some hints by saying:

- The FCC's Competitive Carrier docket, which is aimed at freeing nondominant carriers from regulation, should be completed this year.
- Although Message Toll Service is a candidate for deregulation, "we must wait to see the fruits of the modified final judgment [of the U.S. vs. AT&T antitrust settlement] and our access charge proceeding. At that time, I expect federal regulators to step away."

The access charge proceeding involves the fees for local exchange service paid by interstate communications users. The FCC adopted a new charging scheme last month. While Fowler admitted that deregulation poses problems, he did not say much about them. However, he suggested that tools are available to "ameliorate potential ill effects during" the transition.



Bank Coins Program to Identify Best Trainees

(Continued from Page 1)

scheduled for spring 1982 and winter 1982.

During the spring training session, Taub noted, only three people failed and one left voluntarily to pursue another career.

The graduates of the program are encountering great acceptance within the Systems Group. The Technical Training Department's job is to retain these people. One method is rewarding them with salary increases when they complete the training.

There also are subsequent six-month reviews and possible increases. Technical Training stresses that the cost center managers provide meaningful assignments for the training graduates.

Jeffrey W. Klein

Eleanor F. Miley

Richard P. Halbrook

CW Photos by L. Paul

Training Program Curriculum Features Cobol, JCL, TSO

NEW YORK — Chemical Bank's data processing staff worked with its Technical Training Department to set up the curriculum for the six-month programmer training program.

The curriculum is divided into three levels, based on the importance of various materials to the students' success in the production environment. Of primary importance are the sections on Cobol and IBM's JCL and TSO.

Items of secondary importance include various utilities and procedures. Tertiary items that are considered important primarily for background include assembly language.

The first 4½ months of the training program are spent in the classroom, with George B. Taub and Jeffrey W. Klein of the Technical Training Department teaching the courses and members of the DP staff helping on special topics such as IBM's IMS and CICS. Students receive programming assignments that they can complete either on microcomputers or on terminals connected to the bank's IBM 3081- and 3033-based DP installation.

After this segment of training is completed, each student is assigned to a cost center, a department that generally represents a particular application such as Customer Account System/Demand Deposit Accounts. Supervised by the training staff and the cost center manager, the student spends the next six weeks working on a project that must be put into production.

This is the "acid test of the program," Taub said, noting that the application projects include assignments such as sequential master file updates.

Interview Format Gauges Personal Characteristics

NEW YORK — The aptitude test given to prospective programmer trainees at Chemical Bank here evaluates technical programming skills, "but there were some other things we needed to know about people," recalled Eleanor F. Miley, assistant vice-president for technical training. So, together with a group of managers in the bank's Systems Development Department and the bank's Personnel Research Department, Miley developed the format for a structured interview.

The group came up with 35 characteristics or skills and classified these in seven dimensions, which appear on the evaluation sheet used by the interviewers. These are communication, self-motivation, flexibility regarding work hours, working under pressure, teamwork, perseverance and adaptability.

Because they needed a consistent way of measuring each individual candidate against these dimensions, they developed descriptions under each category called "anchors." These descriptions are based on a scale of one to five. For example, if the person being interviewed displays difficulty in communicating clearly, the interviewer gives him a "1" under communication.

The 45-minute interviews are conducted by three people who represent the technical training and systems development groups. They must reach a consensus on each applicant, so they score each applicant individually and then work together on a joint evaluation.

"Without this particular structure, it would have been chaos," Miley said.

Bank Stresses Test Validation

NEW YORK — When a company decides to use a test to screen people applying for programmer trainee positions, it must have the intent to validate the test for its audience, Eleanor F. Miley, Chemical Bank's assistant vice-president for technical training, said in a recent interview.

Validation is the responsibility of Richard P. Halbrook, assistant secretary of the bank's research department, whose group continuously gathers information, tracking the applicants through the program.

According to Halbrook's statistical analysis of the testing method, the bank's experience has been that about 5% of those tested will fail to complete the program. Given the relationship of the test and training scores, he said it is valid to assume that over 30% of the entire unselected sample would fail the training program if Chemical Bank did not use the test.

Every time a new class comes through, increasing the sample size, Halbrook becomes more confident of his statistics. "We know it is good and it is valid," he said. "It does not have differential prediction for racial groups."

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TI Racing Pegasus Against IBM, DEC Micros

(Continued from Page 1)

In addition to the Professional Computer, TI also unveiled a 150 char./sec dot-matrix graphics printer called the Model 850.

The Professional Computer is competitively targeted toward the IBM Personal Computer and Digital Equipment Corp. Rainbow and Professional 300 series microcomputer marketplace. It is not, however, completely software-compatible with the Personal Computer, said Eric Jones, president of TI's Data Systems Group, adding that it "has a reasonable degree of compatibility" with the IBM micro.

The Professional Computer's basic configuration is said to include 64K bytes of random-access memory, a 12-in. black-and-white monitor, a keyboard containing 12 function keys and a 320K-byte diskette drive.

However, a configuration more typical for business applications consists of the same amount of memory, the same keyboard, a 13-in. color display (which runs the same programs as the 12-in. monochrome display) and dual 320K-byte diskette drives.

The basic Professional Computer system costs $2,595. The expanded version with the color monitor and dual disk drives is priced at $3,840. The prices for both systems do not include the cost of software, the vendor said.

Both systems are reportedly designed to be used by department managers rather than clerical workers.

Two Innovative Options

TI said that what may catapult the Professional Computer above the rank and file of 8088-based machines are the voice management system and "natural language" interface options.

The voice management system combines the functions of speech processing, voice recognition and telephone management functions. One of the system's applications is voice mail, in which users can record a message that can be delivered immediately or at a preset time over a network to other Professional Computers or to a central data base, the spokesman said.

The system can also be used to record and edit dictation or add voice annotation to text and graphics information, according to the spokesman.

The "natural language" interface reportedly directs users in gaining information by helping them ask the computer questions using English words and phrases.

Prices for these options were not available at press time.

TI reportedly designed its Professional Computer system around Intel's 8088 chip in the hope of cashing in on the semiconductor's rapidly expanding and lucrative base of compatible software.

These compatible software packages are said to include:

- Microsoft Corp.'s MS-DOS, Digital Research, Inc.'s CP/M-86, Concurrent CP/M-86 and UCSD's P-System operating systems. (Through a Xedex Corp.-developed softcard called Baby Tex, the system is also reportedly compatible with programs written for the CP/M-80 environment.)
- Integrated applications software such as Lotus Development Corp.'s 1-2-3 and Visicorp's Vision packages.
- Relational Software, Inc.'s relational data base system.
- More than 100 graphics, word processing and financial modeling packages developed by software vendors such as Digital Research, Inc., Lifeboat Associates, Inc., Visicorp and Peachtree Software, Inc.

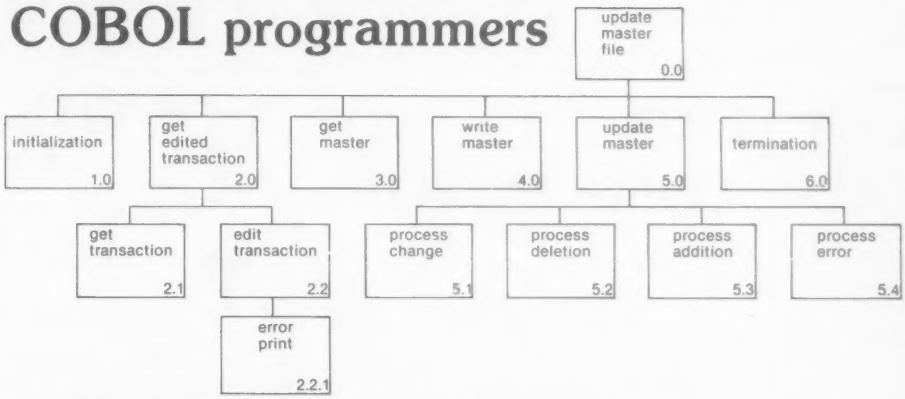
TI's Professional Computer currently has TTY and IBM 3780 communications capabilities; however, in the fall, 3270 bisynchronous communications, Systems Network Architecture and 3101 emulation and communications abilities will be added to provide compatibility with TI's line of minicomputers.

The Model 850 dot-matrix graphics printer outputs an original and two copies and accommodates paper widths from three to 11 inches wide. It is equipped with Epson America, Inc.- and Centronics Data Computer Corp.-compatible interfaces allowing it to be connected to several popular microcomputers, a spokesman said. It costs $599.

Both the Professional Computer and Model 850 printer will be sold directly to large organizations through TI's national accounts program, the spokesman said.

Further information about the desktop system can be obtained from the vendor's Data Systems Group, 12501 Research Blvd., Austin, Texas 78769.

A test for COBOL programmers



What's wrong with this hierarchy chart?

Many things. The numbering system is inefficient (2.0, 2.1, 2.2.1, etc.). Modules 1.0 and 6.0 aren't functional (they are carryovers from unstructured thinking). The module names are inconsistent and imprecise (what's the difference between "error print" and "process error"?). But these are the least of the problems.

What's really wrong with this chart is you can't code a decent COBOL program from it. Why? Because the modules don't have the proper relationships to each other. In particular, modules 2.0, 3.0, and 4.0 should be subordinate to module 5.0. Then, module 0.0 can perform module 5.0 until all records are processed. And module 5.0 can get transactions, get masters, and write masters whenever needed.

Oh sure, there are ways you could make this chart work. You could code a two-paragraph section for module 0.0 and have the first paragraph perform the second one until all records are processed. Or, you could make modules 2.0, 3.0, and 4.0 subordinate to both modules 0.0 and 5.0. Either way, though, you end up with a sloppy programming product ... and you defeat the principles of structured design and structured programming.

Oddly enough, this chart was made up from examples taken from leading books and courses on structured design. In other words, everything that is wrong with this chart is presented as right by one educator or another. So it's little wonder to me that structured design and structured programming have a long way to go before they live up to their promise.

30-day trial and unlimited guarantee

First, take up to 30 days to review the books without paying anything. Second, if these books don't actually change your methods of program development, you can return them for a full refund, no matter how long you've had them.

A better method of design

If you'd like to learn a better way to develop hierarchy (or structure) charts, I'd like to recommend a couple of books to you. They were written by Paul Noll, a former trainer for a large company in San Francisco who is now an independent consultant to companies across the nation. He is one of the leading COBOL experts in the country, and he has some unique ideas about structured design. His books are written specifically for the experienced COBOL programmer.

In the first book, *Structured Programming for the COBOL Programmer*, Paul shows you how to create a structure chart that will be an efficient guide to your COBOL coding. You'll learn the four steps for creating structure charts ... what modules should go at what level ... how to create functional module names that tie in to the paragraph names of the COBOL program ... how to number the modules so the numbers can become part of the COBOL paragraph names ... the six things to watch for when reviewing a structure chart ... and much more. As a bonus, this book also covers structured coding, top-down testing, and structured walkthroughs ... so you can see how the effectiveness of these techniques depends upon the strength of the structure chart.

The second book, *The Structured Programming Cookbook*, is a tool kit for the development of structured COBOL programs. It gives standards and guidelines for program development so it becomes an instant standards manual for a structured COBOL shop. And it gives complete design, documentation, and code for four different types of business programs. As a result, this book can have a major effect on programmer productivity because it helps stop program re-invention.

If you're already using structured design and structured programming, I'm convinced that Paul's books will help you to improve your methods ... and your results. On the other hand, if you haven't yet been convinced of the value of structured techniques, you've got some exciting reading ahead of you. I think you'll be anxious to put Paul's practical ideas to work once you've finished the books ... and you'll find his structured techniques are easy to implement using the books alone.

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S-7

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Dear Mike: Send me the books I've indicated so I can evaluate Paul's methods for myself. If I don't discover a better, more exciting way to develop structured COBOL programs, I'll return the books for a full refund.

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Data Entry Certification Tests Set for May, June

By Patricia Keefe
CW Staff

STAMFORD, Conn. — The first tests for data entry professionals who want to be certified by the Data Entry Management Association (Dema) will be given at the conclusion of two Mini-Conference and Professional Growth Seminars that Dema will hold May 16-18 in Dallas and June 5-8 in Scottsdale, Ariz.

The tests, which will take 90 minutes, will cover documentation, motivation, programming, training, forms and equipment design, interviewing, scheduling and control. The examination is optional and will follow the conclusion of the program, according to Marilyn Bodek, Dema executive director.

The exam will be graded with the aid of several professors of education who have been advising Dema over the years, Dema President Norman Bodek added.

The tests represent the culmination of two years of study by Dema committees into the professional certification process, according to Marilyn Bodek. The certification criteria and tests were developed by Dema officials working in tandem with chapter members after consultation with several testing services, she said.

Dema officials are hoping a Certificate in Data Entry (CDE) will bring holders "the respect and recognition that other certified professions have enjoyed for years," Marilyn Bodek added. Data entry professionals have been "ignored and looked down upon," said Norman Bodek, who likened the basic scope of a data entry worker's responsibilities to that of a concert pianist.

While Marilyn Bodek admitted there is no guarantee that CDE holders will find greater recognition and better pay as a result of their accreditation, she pointed to other certification programs — the Certificate in Data Processing and the Certificate in Computer Programming — and said it is likely that any employer would notice and appreciate the difference between certified and non-certified professionals.

Dema Vice-President Barbara Bradley sees the certification process as a way for data entry professionals to continue their education and remain abreast of technological changes in the field. "It would be a wonderful way for someone fairly new to broaden his knowledge and so elevate his performance," she said.

Some aspects of the Dema certification process are still unresolved. For example, there are no prerequisites for people who wish to take the exam, such as education or hours in the field. Nor has it been decided whether recertification is necessary and, if so, how often retesting should be conducted.

Anyone in the field who has taken the certification course, included as part of the conference program, should be able to pass the exam, Dema's president said. "This test is not designed to trick people," he added.

Sessions Precede Test

The sessions preceding the tests will be broken into two 1½-day parts. The first part will consist of several miniconferences and two concurrent sessions covering issues such as data entry in the electronic office, data entry in local networks and the expanding role of data entry in the organization.

The second day-and-a-half will concentrate on two seminars — the certification program and "Increasing Quality and Production."

The seminars and certification program will be conducted by Norman Bodek and other association officials. Registration fees are $250 for members and $290 for nonmembers taking the 1½-day-long miniconference; $285 for members and $325 for nonmembers taking the 1½ days of seminars; $470 for members and $510 for nonmembers taking the entire three-day program.

For those taking the optional exam, an additional $35 is charged, according to Dema, which can be reached through P.O. Box 3231, Stamford, Conn. 06905.

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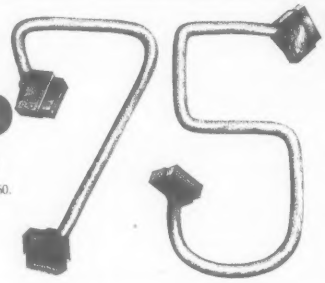

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BC02S-05/BJ	Cable, WO23-WO23 TUS5 5FT	180	45	75
BC03L-05/BJ	EIA Cable, H856 TO RS232C MAL	250	110	56
BC03M-A0/BJ	100' Null Modem Ext Cable	140	95	32
BC03N-A0/BJ	Coax Cable 100 Foot	140	80	42
BC03N-A5/BJ	Special Built Cable 150FT	200	100	50
BC03P-A0/BJ	Null Modem, 2 Fem Ends, 100FT	150	90	40
BC04R-10/BJ	Special Built Cable 10FT	32	22	31
BC04R-12/BJ	Mate-N-Lok to 4 Rings, 12FT	34	24	29
BC04R-A0/BJ	Special Cable 100FT	100	70	30
BC04R-B0/BJ	Mate-N-Lok to 4 Rings, 200'	200	130	35
BC04Z-01/BJ	H856 40 Conductor Flat (1')	48	26	45
BC04Z-06/BJ	H856 40 Conductor Flat (6')	90	36	60
BC04Z-10/BJ	H856 40 Conductor Flat (10')	52	35	32
BC04Z-15/BJ	H856 40 Conductor Flat (15')	80	40	50
BC04Z-25/BJ	H856 40 Conductor Flat (25')	90	45	50
BC05C-09/BJ	Cable Modem 9FT	112	80	28
BC05C-25/BJ	BC05C-25 Cable Modem	120	90	25
BC05D-15/BJ	RS232 Male-Fem, 25 Cond, 15FT	175	90	28
BC05D-20/BJ	RS232 Male-Fem, 25 Cond, 20FT	130	95	26
BC05D-25/BJ	RS232 Male-Fem, RS232 Fem 25	140	100	28
BC05D-50/BJ	RS232 Male to Female, 50FT	150	110	26
BC05D-75/BJ	RS232 Male-Fem, 25 Cond, 75FT	225	160	28
BC05F-A0/BJ	Cable Interface LA30S	150	75	50
BC05J-06/BJ	Line Cord Set 240 V 6 FT	100	65	35
BC05L-15/BJ	H855 TO H855 Flat Reverse 15	80	40	50
BC05M-04/BJ	Cable H856 to Mat-N-Lok 4'	42	20	52
BC05M-20/BJ	Special Cable 20FT	82	40	35
BC05M-25/BJ	Cable H856 to M-N-Lock 25'	65	45	30
BC05M-50/BJ	Cable H856 to M-N-Lock 50'	90	80	33
BC05W-10/BJ	50 Conductor Signal Cable 10'	85	45	47
BC05W-25/BJ	50 Conductor Signal Cable 25'	160	85	46
BC06F-25/BJ	M908 TO Compstar 191, 25 FT	425	225	47
BC06K-10/BJ	H885-H885, Mirror Conn, 10 FT	100	50	50
BC06S-25/BJ	Round Massbus Cable, 25 FT	1,040	425	59
BC07A-10/BJ	Cable H856 1-End 26 TW PR 10'	130	70	46
BC07A-25/BJ	Cable H856 1-End 26 TW PR 25'	154	120	22
BC07B-25/BJ	Cable H856 1-End 11 TW PR 25'	200	90	55
BC07D-15/BJ	H856 2-20 COND Ribbons 15'	140	85	39
BC07D-25/BJ	H856 2-20 COND Ribbons 25'	180	100	37
BC08A-02/BJ	M903 to M903 Dual Mylar 2'	150	40	73
BC08A-05/BJ	M903 to M903 Dual Mylar 5'	200	50	75
BC08A-07/BJ	M903 to M903 Dual Mylar 7'	220	55	75
BC08A-09/BJ	(M903-M903) 1.25" Mylar (9')	235	60	74
BC08A-10/BJ	M903 to M903 Dual Mylar 10'	250	65	74
BC08A-15/BJ	Cable, BC08A	300	75	75
BC08A-25/BJ	M903 to M903 Dual Mylar 25'	350	90	74
BC08F-06/BJ	Cable Module	300	100	66
BC08J-06/BJ	H856 to M953 40 CND 3M 6'	125	80	36
BC08J-10/BJ	H856 to M953 40 CND 3M 10'	180	90	50
BC08J-15/BJ	H856 to M953 40 CND 3M 15'	215	100	53
BC08J-25/BJ	H856 to M953 40 CND 3M 25'	250	110	56
BC08J-50/BJ	Cable IO PDP8E	300	135	55
BC08K-06/BJ	H856 to M955 40 CND 3M 6'	250	100	60
BC08K-15/BJ	H856 to M955 40 CND 3M 15'	300	125	58
BC08M-0M/BJ	H807 to H807 Mylar 11"	250	120	52
BC08R-06/BJ	H856-H856 3M REV 6'	68	35	48
BC08R-20/BJ	H856-H856 3M Cable (20')	90	55	39
BC08S-05/BJ	H856-H856 3M Strait, 5 FT	80	30	50
BC08S-06/BJ	H856-H856 40 Cond, Cable 6 FT	60	32	48
BC09B-07/BJ	Cable M912 12FT	1,836	800	56
BC09B-10/BJ	I/O Bus M912 Cable 10 FT	1,963	825	57
BC09B-12/BJ	I/O Bus 2 M912 to 1 M912, XXFT	2,000	875	56
BC10K-05/BJ	Cable 5 FT, Quick Latch	2,373	1,400	41
BC10K-10/BJ	10 MEM BUS Cable 10 FT	2,551	1,500	41
BC10K-15/BJ	10 MEM BUS Cable 15 FT	2,725	1,650	39
BC10K-25/BJ	PDP 10 MEM BUS Cable	3,073	1,875	39
BC10K-35/BJ	PDP 10 MEM BUS Cable	3,443	2,100	39
BC10L-35/BJ	AMP Quick Latch to (5) W021 Cable	2,750	800	70
BC11A-02/BJ	External Unibus 2'	135	90	33
BC11A-05/BJ	External Unibus 5'	155	110	29
BC11A-06/BJ	External Unibus 6'	160	115	28
BC11A-08/BJ	External Unibus 8'	170	125	26
BC11A-10/BJ	External Unibus 10'	182	130	28
BC11A-15/BJ	External Unibus 15'	210	160	23
BC11A-17/BJ	Special Cable 17FT	215	170	20
BC11A-20/BJ	External Unibus 20'	280	175	37
BC11A-25/BJ	External Unibus 25'	230	180	21
BC11A-35/BJ	External Unibus 35'	400	300	25
BC11A-50/BJ	External Unibus 50'	450	350	22
BC11K-25/BJ	H856 1 End 20 Pair 25'	180	90	50
BC11S-25/BJ	H856 TO H856 18 TW PR 25'	138	90	34
BC11S-50/BJ	H856 TO H856 18 TW PR 50'	173	125	27
BC11S-A0/BJ	H856 TO H856 18 TW PR 100'	277	190	31
BC20Y-25/BJ	TU58 Cable, 25 FT	120	45	62
BC20Z-25/BJ	TU58 Cable, 25 FT	120	45	62
9C215-25/BJ	VK170 10 Pin Comm Cable	120	40	66
BC22A-10/BJ	Null Modem RS 232 C 10'	48	30	37
BC22A-25/BJ	Null Modem RS 232 C 25'	55	40	27
BC22A-35/BJ	Null Modem RS 232 C 35'	85	50	23
BC22A-50/BJ	Null Modem RS 232 C 50'	80	60	25
BC22B-10/BJ	RS232C Male to Fem 14 CND 10'	55	30	45
BC22B-25/BJ	RS232C Male to Fem 14 COND 25'	65	40	38
BC22B-35/BJ	RS232C Male to Fem 14 COND 35'	75	56	26
BC22B-50/BJ	RS232C Male to Fem 14 COND 50'	90	60	33
BC24C-10/BJ	Null Modem Cable	75	50	33
BC24C-25/BJ	25PIN Fem-10PIN Null Modem 25'	100	85	15
BC24Z-A0/BJ	Long Line Cable Kit 100 FT	500	350	30
BC24Z-E0/BJ	Long Line Cable Kit 500 FT	1,350	975	27
BC24Z-H5/BJ	Long Line Cable Kit 750 FT	1,750	1,325	24
BC26B-01/BJ	VK100 Y-Cable 1 FT	85	50	41
BCV1A-06/BJ	6 Foot Cable Ass. (2-3)	250	160	36
BCV1B-06/BJ	6 Foot Cable Ass. (1-2)	360	175	50

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4A-LOTCB-AG/BJ	Lot of 5, BC03M-A0 (100' Cable)	616	425	31
4A-LOTCB-AH/BJ	Lot of 10, BC03M-A0 (100' Cable)	1,116	750	33
4A-LOTCB-AJ/BJ	Lot of 25, BC03M-AG (100' Cable)	2,748	1,695	38
4A-LOTCB-AK/BJ	Lot of 50, BC03M-A0 (100' Cable)	4,997	3,195	36
4A-LOTCB-AQ/BJ	Lot of 5, BC05C-25 (25' Cable)	543	425	21
4A-LOTCB-AR/BJ	Lot of 10, BC05C-25 (25' Cable)	1,015	795	21
4A-LOTCB-AS/BJ	Lot of 25, BC05C-25 (25' Cable)	2,363	1,895	19
4A-LOTCB-AT/BJ	Lot of 25, BC05C-25 (25' Cable)	4,375	3,595	17
4A-LOTCB-BC/BJ	Lot of 5, BC05D-25 (25' Cable)	648	475	26
4A-LOTCB-BD/BJ	Lot of 10, BC05D-25 (25' Cable)	1,197	895	25
4A-LOTCB-BE/BJ	Lot of 25, BC05D-25 (25' Cable)	2,742	2,175	20
4A-LOTCB-BF/BJ	Lot of 50, BC05D-25 (25' Cable)	5,152	3,950	23
4A-LOTCB-BG/BJ	Lot of 5, BC05D-50 (50' Cable)	695	525	24
4A-LOTCB-BH/BJ	Lot of 10, BC05D-50 (50' Cable)	1,318	995	24
4A-LOTCB-BJ/BJ	Lot of 25, BC05D-50 (50' Cable)	3,115	2,375	23
4A-LOTCB-BK/BJ	Lot of 50, BC05D-50 (50' Cable)	5,750	4,495	21
4A-LOTCB-CG/BJ	Lot of 5, BC11A-02 (2' Cable)	626	435	30
4A-LOTCB-CH/BJ	Lot of 10, BC11A-02 (2' Cable)	1,186	850	28
4A-LOTCB-CJ/BJ	Lot of 25, BC11A-02 (2' Cable)	2,800	1,995	28
4A-LOTCB-CK/BJ	Lot of 50, BC11A-02 (2' Cable)	5,272	3,895	26
4A-LOTCB-CL/BJ	Lot of 5, BC11A-10 (10' Cable)	848	625	26
4A-LOTCB-CM/BJ	Lot of 10, BC11A-10 (10' Cable)	1,603	1,200	25
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4A-LOTCB-CT/BJ	Lot of 50, B11A-15 (15' Cable)	8,384	6,995	16
4A-LOTCB-DB/BJ	Lot of 5, BC22A-10 (10' Cable)	228	140	38
4A-LOTCB-DC/BJ	Lot of 10, BC22A-10 (10' Cable)	436	260	40
4A-LOTCB-DD/BJ	Lot of 25, BC22A-10 (10' Cable)	1,038	600	42
4A-LOTCB-DE/BJ	Lot of 50, BC22A-10 (10' Cable)	1,935	1,095	43
4A-LOTCB-DF/BJ	Lot of 5, BC22A-25 (25' Cable)	282	190	27
4A-LOTCB-DG/BJ	Lot of 10, BC22A-25 (25' Cable)	488	260	27
4A-LOTCB-DH/BJ	Lot of 25, BC22A-25 (25' Cable)	1,181	650	28
4A-LOTCB-DJ/BJ	Lot of 50, BC22A-25 (25' Cable)	2,235	1,495	33
4A-LOTCB-DK/BJ	Lot of 5, BC22B-10 (10' Cable)	257	145	43
4A-LOTCB-DL/BJ	Lot of 10, BC22B-10 (10' Cable)	487	270	44
4A-LOTCB-DM/BJ	Lot of 25, BC22B-10 (10' Cable)	1,151	660	43
4A-LOTCB-DN/BJ	Lot of 50, BC22B-10 (10' Cable)	2,186	1,150	46
4A-LOTCB-DP/BJ	Lot of 5, BC22B-25 (25' Cable)	307	195	36
4A-LOTCB-DQ/BJ	Lot of 10, BC22B-25 (25' Cable)	580	380	34
4A-LOTCB-DR/BJ	Lot of 25, BC22B-25 (25' Cable)	1,367	900	34
4A-LOTCB-DS/BJ	Lot of 50, BC22B-25 (25' Cable)	2,598	1,650	35
4A-LOTCB-DT/BJ	Lot of 5, BC04R-12 (12' Cable)	161	110	31
4A-LOTCB-DU/BJ	Lot of 10, BC04R-12 (12' Cable)	307	199	35
4A-LOTCB-DV/BJ	Lot of 5, BC04Z-10 (10' Cable)	243	165	32
4A-LOTCB-DW/BJ	Lot of 10, BC04Z-10 (10' Cable)	452	299	33
4A-LOTCB-DX/BJ	Lot of 5, BC04Z-25 (25' Cable)	418	215	48
4A-LOTCB-DY/BJ	Lot of 10, BC04Z-25 (25' Cable)	777	410	47
4A-LOTCB-EB/BJ	Lot of 5, BC05F-A0 (Cable In)	515	350	61
4A-LOTCB-EC/BJ	Lot of 10, BC05F-A0 (Cable In)	1,708	650	61
4A-LOTCB-ED/BJ	Lot of 5, BC05M-04 (4' Cable)	200	95	52
4A-LOTCB-EE/BJ	Lot of 10, BC05M-04 (4' Cable)	378	175	53
4A-LOTCB-EK/BJ	Lot of 5, BC06S-25 (25' Cable)	4,875	1,995	59
4A-LOTCB-EL/BJ	Lot of 10, BC06S-25 (25' Cable)	9,176	3,750	59
4A-LOTCB-EP/BJ	Lot of 5, BC07A-10 (10' Cable)	641	575	10
4A-LOTCB-EQ/BJ	Lot of 10, BC07A-25 (25' Cable)	1,128	1,095	2
4A-LOTCB-ET/BJ	Lot of 5, BC07D-15 (15' Cable)	649	395	39
4A-LOTCB-EU/BJ	Lot of 10, BC07D-15 (15' Cable)	1,198	775	35
4A-LOTCB-EV/BJ	Lot of 5, BC07D-25 (25' Cable)	758	495	34
4A-LOTCB-EW/BJ	Lot of 10, BC07D-25 (25' Cable)	1,397	950	31
4A-LOTCB-EZ/BJ	Lot of 5, BC08S-06 (6' Cable)	298	140	53
4A-LOTCB-FA/BJ	Lot of 10, BC08S-06 (6' Cable)	596	275	54
4A-LOTCB-FD/BJ	Lot of 5, BC11S-25 (25' Cable)	647	425	34
4A-LOTCB-FE/BJ	Lot of 10, BC11S-25 (25' Cable)	1,204	795	33
4A-LOTCB-FF/BJ	Lot of 5, BC11S-50 (50' Cable)	811	595	26
4A-LOTCB-FG/BJ	Lot of 10, BC11S-50 (50' Cable)	1,510	1,095	27
4A-LOTCB-FH/BJ	Lot of 5, BC11S-A0 (100' Cable)	1,297	925	28
4A-LOTCB-FJ/BJ	Lot of 10, BC11S-A0(100' Cable)	2,415	1,795	25
4A-LOTCB-FK/BJ	Lot of 5, 70-11212-25 (Cable)	900	475	47
4A-LOTCB-FL/BJ	Lot of 10, 70-11212-25 (Cable)	1,626	895	44
4A-LOTCB-FM/BJ	Lot of 5, 70-11212-50 (Cable)	1,134	625	44
4A-LOTCB-FN/BJ	Lot of 10, 70-11212-50 (Cable)	2,130	1,195	43
4A-LOTCB-FX/BJ	Lot of 5, BC10K-05 (5' Cable)	11,078	8,750	38
4A-LOTCB-FY/BJ	Lot of 10, BC10K-05 (5' Cable)	20,570	12,750	38
4A-LOTCB-FZ/BJ	Lot of 25, BC10K-05 (5' Cable)	46,150	29,875	35
4A-LOTCB-GA/BJ	Lot of 5, BC10K-10 (10' Cable)	11,905	7,250	38
4A-LOTCB-GB/BJ	Lot of 10, BC10K-10 (10' Cable)	22,109	13,995	36
4A-LOTCB-GC/BJ	Lot of 25, BC10K-10 (10' Cable)	49,804	33,125	33
4A-LOTCB-GD/BJ	Lot of 5, BC10K-25 (25' Cable)	14,365	9,125	36
4A-LOTCB-GE/BJ	Lot of 10, BC10K-25 (25' Cable)	26,879	17,900	32
4A-LOTCB-GF/BJ	Lot of 25, BC10K-25 (25' Cable)	59,858	39,750	33
4A-LOTCB-GG/BJ	Lot of 5, BC10K-35 (35' Cable)	16,086	9,995	37
4A-LOTCB-GH/BJ	Lot of 10, BC10K-35 (35' Cable)	29,837	18,950	36
70-08267-00/BJ	Cable Module PC04	148	100	32
70-09562-00/BJ	Cable PWR Dist	39	29	25
70-11212-25/BJ	LP11 Interface Cable	200	100	50
70-11212-50/BJ	LP11 Interface Cable	250	130	48
70-11217-15/BJ	Cable Assy, 15 FT	250	90	64
70-11217-25/BJ	Cable Card Reader Interface	450	150	66

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Proceedings Out On Conferences

BROOKLINE, Mass. — Information Gatekeepers, Inc. is making available proceedings from two of its recently held conferences.

Proceedings from "The First International Local-Area Networks Conference and Exhibition" is a 92-page compilation of 18 papers presented at the conference last September. The papers focus on key issues of the applications and design of local-area networks such as architectures, protocols, standards problems and applications. The proceedings cost $125 a copy, the firm said.

Proceedings from Information Gatekeeper's April conference, "The Second International Videotext in the 1980s Conference and Exhibition," include 37 papers presented at the conference. Subjects covered include system descriptions, strategic outlooks, technical advances and discussions of various videotext applications. The proceedings cost $120, the firm said from 167 Corey Road, Brookline, Mass. 02146.

DP-Based Intelligence Agency Goes Under

By Jake Kirchner
CW Washington Bureau

ARLINGTON, Va. — The financial backers of International Reporting Information Systems (Iris), the expensive computer-based intelligence agency founded late last year for private corporations, sent the company into bankruptcy when they abruptly cut off additional development money late last month.

Iris executives last week filed the necessary papers to shut down the firm. However, at press time, Iris employees and creditors were waiting to hear if the firm might be restructured under bankruptcy protection and continue operation at some level.

Officials for the firm could not be reached for comment.

The end reportedly came as a surprise to Iris employees and customers. Several noted last week that following a one-third reduction in the Iris work force last month, the backers of the venture, primarily several large financial institutions in Europe, had voiced a strong commitment to see the firm fully operational.

Iris was founded in late 1981 with considerable fanfare here and abroad. The intelligence agency's plan was to attract large information-hungry corporations that would pay as much as $100,000 as a minimum for Iris services.

With start-up costs estimated as high as $20 million and with an international advisory council, including such luminaries as former British Prime Minister Edward Heath and former World Bank President Robert McNamara, the firm made an immediate splash in the international community.

Services Offered

Iris' services were to include customer-tailored reports on the political, social and economic activities of foreign countries and regions. Based on information from a network of Iris journalists and from thousands of published reports captured every day by Iris computers, the reports were to be put together by a large staff of experienced, multilingual analysts and then transmitted to customers' terminals.

The unique, sophisticated computer-based system at the heart of the Iris plan was developed by a team of former U.S. intelligence and Defense Department computer experts and was based on ideas currently in use in U.S. intelligence agency systems, according to Iris.

The system, based on Burroughs Corp. hardware, was considered so innovative that Burroughs Chairman Michael Blumenthal recently helped inaugurate Iris' computer center [CW, Nov. 22].

Adviser to Reagan

Head of Commerce's NTIA Resigns Post

WASHINGTON, D.C. — Bernard J. Wunder, chief Reagan administration adviser and spokesman on telecommunications and information policy matters, has resigned his position as assistant secretary of commerce.

Wunder will leave the post on March 1 to take part in several business ventures in the communications field in Texas. In his present Commerce Department post, Wunder heads the National Telecommunications and Information Administration (NTIA).

Wunder plans to work with former Texas Congressman Jim Collins in developing new companies, perhaps in the cable, cellular radio or broadcast areas.

"My experience is here in Washington," Wunder said last week. "What I need to do is go out and get experience in sort of the operational side of the marketplace."

There are no reliable indications at this point as to who will succeed him as NTIA head.

Wunder worked for Collins from 1973 to 1975 and later held several positions with House committees, including that of chief counsel and staff director of the Communications Subcommittee. He was appointed NTIA head in 1981.

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323

Network Concentrator Leads Product Parade

By Bruce Hoard
CW Staff

NEW ORLEANS — Infotron Systems Corp. topped the list of vendors with new products to show at last week's Communication Networks Conference & Exposition (Comnet '83) when it introduced its Model 792 network concentrator.

The 792 is said to reduce communications costs by concentrating data from many terminals over a single high-speed link or over multiple links to other 792 locations. It reportedly ensures error-free transmission, features switching and contention capabilities and provides redundancy options that eliminate the possibility of total system failure.

Input to the concentrator may be any combination of synchronous and asynchronous, dial-up and dedicated transmission at mixed speeds and protocols to 9,600 bit/sec, Infotron said. The unit accommodates a variety of binary synchronous protocols including IBM's Binary Synchronous Communications (BSC), Honeywell, Inc.'s GRTS II and Control Data Corp.'s UT-200.

CW at Comnet '83

The 792 was designed to handle new protocols as they evolve into common usage, an Infotron spokesman claimed.

Prices for the 792 start at $4,500, from Infotron at Cherry Hill Industrial Center, Cherry Hill, N.J. 08003.

Icot Corp. introduced three specialized airline CRT terminals designed to meet current airline requirements and allow expansion for future applications such as personal computing and local storage.

The Models 757, 767 and 768 perform a range of applications, including airline reservations, travel agency information retrieval and cargo systems support.

The terminals range in price from $1,995 to $3,500, depending on configuration and quantity. Icot is based at 830 Maude Ave., P.O. Box 7248, Mountain View, Calif. 94043.

New from On-Line Software International, Inc. was Telefile, a software system for bulk data transmission in IBM MVS Vtam environments. Nontechnical users can manage and process remote data sets in a distributed network with Telefile by identifying the remote CPU and specifying whether a particular file is being sent or received.

A permanent Telefile license costs $15,000, available during the second quarter of this year. On-Line Software International can be reached at Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

Associated Computer Consultants, Inc. (ACC) unveiled its Network Systems (NS) protocol package, an implementation of the Xerox Corp. Network Systems Protocols. The NS package is part of the vendor's Associated Computer Consultants Exchange System product line.

NS reportedly provides simple interprocessor communications between distributed resources for a variety of local-area network hardware implementations. It supports Digital Equipment Corp. PDP-11 and VAX-11 processors and the Unix, RSX and VMS operating systems.

Two versions are available. The NU-11/NS costs $4,500 for one to four units and $2,500 for additional units. The FE-11/NS costs $9,500 for one to four units and $7,500 for additional units.

ACC's home base is at 720 Santa Barbara St., Santa Barbara, Calif. 93101.

McGill Details AIS/1000 Plans

NEW ORLEANS — Users of Advanced Information Systems/Net 1000 (AIS/Net 1000) will be able to communicate with the network digitally, without modems, over existing dial-up local loops, American Bell, Inc. Vice-President Arch McGill indicated last week.

In a press conference convened at the Communication Networks Conference & Exposition, McGill also announced that the Dimension Prelude private branch exchange, which previously had a capacity of 30 to 100 lines, now supports a maximum of 400 lines.

He also said that any terminal that communicates via the Net 1000 network can function with the newly announced Dimension AIS/System 85 [CW, Jan. 24].

The American Bell executive declared that the number of Net 1000 access points will be expanded significantly by the end of this year, but he dodged a direct answer when asked if American Bell would continue AT&T's campaign to scuttle the separate subsidiary provision of the Federal Communications Commission's Second Computer Inquiry Decision. He made it clear, however, that he strongly opposes any restrictions on AT&T, such as the separate subsidiary provision, that are not also imposed on its competitors.

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Florida took the CPMS™/SYSD™ package giving them the spool display that lets them scan any job as it goes through the system before it is printed. Then, if it isn't exactly what they want, they can purge and re-do it with no lost printing time and costs.

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Strategist Says BOCs Eyeing Ventures With Other Firms

By Phil Hirsch
CW Washington Bureau

NEW ORLEANS — Joint ventures with terminal equipment makers, information services vendors and others outside the telephone industry are a key part of the Bell operating companies' marketing plans, one of their chief strategists said here last week at a Communication Networks Conference & Exposition (Comnet '83) session.

Another speaker at the same session — Albert Halperin, chief of the Federal Communications Commission's (FCC) Planning and Policy Division — reported that the separation between competitive and monopoly services established in the FCC's Second Computer Inquiry decision will not bar deregulation of competitive services in markets that require continued regulation.

The news that Bell operating companies will form joint ventures with nontelephone companies came from Thomas E. Bolger, who is now executive vice-president of AT&T, but will become chief executive officer of one of the seven regional holding companies that will own the 22 to-be-divested Bell operating companies.

With partners, the Bell operating companies "can be and will be co-developers and co-providers of new offerings utilizing network switching, transport, transmission and call management capabilities," Bolger asserted.

ISDN Services

Bolger stressed the Bell operating companies' intention of introducing integrated switched digital network (ISDN) services as another means of being "in the forefront of the information age."

The beginning of the local ISDN will be the introduction "in the not-too-distant future of services such as local-area data transport — for low- to medium-speed data services — and circuit-switched digital capability, for high-speed data services," Bolger said.

Bolger and Halperin were two participants in a Comnet '83 panel on the future of local telephone service in the aftermath of the AT&T divestiture. The hot potato tossed back and forth by the panelists was what local service would cost and how those costs would be allocated.

Bolger said the financial viability of the Bell operating companies rests "squarely on our ability to drive local service prices to costs." To mitigate the threat of bypass, "the non-traffic-sensitive burden of the customer loop must be removed from toll and carrier-access charges."

Although this is one major aim of the new access charge plan adopted by the FCC last month, the idea is not endorsed universally.

One skeptic present at last week's panel was Edward F. Burke, chairman of the National Association of Regulatory Utilities Commissions, the chief lobbying group of state regulators.

Pointing out that the basic aim of the Communications Act of 1934 was to bring about universal telephone service at an affordable price, Burke contended that "insofar as you diminish universality and affordability, you diminish the value of communications service for all."

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He believes "some sort of regulatory framework will continue to be needed, particularly to maintain universal service. I'm not as blindly optimistic as some on this panel," Burke maintained.

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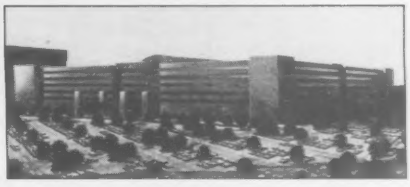

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CW Photo by J. Bartimo

A dish antenna watches over the Comnet exhibit hall.

Hot Topic at Conference

Panel Looks at Bypass Technology

By Phil Hirsch
CW Washington Bureau

NEW ORLEANS — "Bypass" was a hot topic here last week at the Communication Networks Conference & Exposition (Comnet '83) for an understandable reason.

Escalating private-line rates plus a growing demand for data speeds above 9,600 bit/sec have forced volume users to look for alternatives to telephone company-provided local loop facilities. But if the discussion at a Comnet '83 panel session last week was any indication, it will be a while before bypass becomes a viable local-loop alternative for most of those who need relief.

The bypass technology receiving the greatest amount of attention in the past few years has been embodied by digital termination services (DTS), which basically consist of a centrally located, omnidirectional microwave transceiver that communicates with remote user stations via shared 1.5M bit/sec, full-duplex channels. According to Jeffrey Krause, one of the Comnet panelists, the Federal Communications Commission's (FCC) recent access charge decision placed a major cloud over DTS.

CW at Comnet '83

Krause, vice-president of M/A-COM Development Corp., which owns Local Digital Distribution, Inc., the major U.S. supplier of DTS systems, explained that DTS appears to be more cost-effective than telephone company-provided local loop facilities. But since the commission's access charge decision will force a major revision of local telephone company rates, the amount of the difference will probably remain unclear until the end of the year, when the FCC is expected to accept new telephone company tariffs.

One question raised by this situation is whether the telephone companies can reprice their services low enough to kill off the competition before it has a chance to get established. Robert K. Bennett, marketing vice-president of United Telecommunications, Inc., insisted that this cannot happen because DTS and other bypass technologies use more modern technology than the telephone companies and have less overhead with which to contend.

Bennett acknowledged, however, that the limited bandwidth reserved for DTS is a significant disadvantage, at least for now, because it bars DTS carriers from transmitting voice. But DTS vendors are not wedded to DTS technology, he observed.

DTS Only One Option

Most of the companies planning to offer DTS are established, specialized carriers. For example, Bennett's company owns Isacomm, Inc., a resale carrier that leases satellite channels from Satellite Business Systems and resells them to insurance companies. DTS represents only one of the ways Isacomm and other DTS operators can reach their customers.

The other alternatives include CATV, point-to-point microwave and multipoint distribution service. The last is a specialized, microwave-based technology already operational in most of the nation's major urban areas; it is now an adjunct to cable TV networks and is used primarily to carry commercial TV programs.

In most cases, these alternative delivery systems have enough bandwidth to support voice, but because of technical and/or regulatory difficulties, it may be some time before they can be widely used, the panelists indicated.

For example, CATV — widely touted as a formidable competitor to telephone company local loops — cannot really compete until two-way systems are operating in several cities. CATV stations become individually addressable and interconnection is achieved among cable nets serving the same areas, according to Robert Schmidt, former president of the National Cable Television Association. Although work is under way in all of these areas, Schmidt indicated that it will be a minimum of two years and probably much longer before CATV's shortcomings are reduced sufficiently.

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PRC Buys Headquarters, Cuts Data Costs by Reselling Facilities to Other Tenants

By Jim Bartimo
CW Staff

NEW ORLEANS — Unlike many businesses that resell common carrier lines, Planning Research Corp. (PRC) never leaves its McLean, Va., headquarters building to find customers for its voice and data networks.

Speaking at the Communication Networks Conference & Exposition (Comnet '83) here last week, PRC's telecommunications manager told how the consulting firm lowered costs by reselling data processing and telephone services to the other tenants of the building, which houses PRC's corporate headquarters, engineering and other departments. Some 70,000 of the cross-shaped building's 481,000 square feet are occupied by other companies.

"In the process of occupying the building," John D. Daly recounted, "it was decided that all services would be shared by the tenants — including data processing and telecommunications."

All the businesses in the PRC-owned building share a private branch exchange telephone system that offers TWX, Telex, facsimile, Wats lines, long-distance services from MCI Communications Corp. and satellite services from Satellite Business Systems. As with all resale common carriers, PRC buys these services from the vendors and then offers them to its own customers, Daly said.

To Keep Costs Down

"We didn't go into this to make money," Daly said, "We just did it to keep costs down. The more people that use the switch, the cheaper it is. It's used to attract tenants."

PRC has reserved 2,100 telephone numbers from the phone company, Daly said. While PRC acts as a scaled-down telephone company, it offers something to its customers that phone companies reportedly do not — training for all functions contained in each handset and a message center.

"Our studies showed that we were not answering 60 phone calls per day," Daly said. But with this service, "if my phone rings and isn't answered in four rings, the call goes directly into the message center."

Message Waiting

A message center operator enters the message on a terminal and places the message in Daly's file. When Daly returns to his desk, a "message waiting" light tells him to call the message center.

In addition to offering extensive telephone service to its customers, PRC also offers data processing through a kind of local-area network. "When we moved into the building," Daly said, "we had 22 computer systems. We made the decision to connect them through six-pair, 24-gauge Teflon twisted pair wiring."

Some 266 terminals are linked to PRC's data processing equipment by an RJ-11 telephone connector and an RJ-45 data connector at each desk. Data rates from 300 to 1.5M bit/sec are achieved, according to Daly.

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"The practicality of the system is tremendous," Daly said, noting that one established system also prevents extensive rewiring for tenants' individual phone and data networks.

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Firms Shoot for 'Info Utility,' Net Consolidation

By Bruce Hoard
CW Staff

NEW ORLEANS — Pitney Bowes, Inc. wanted data and voice together in one "information utility." Union Carbide Corp. wanted to eliminate a proliferation of applications-oriented networks.

Attendees at the Communication Networks Conference & Exposition (Comnet '83) here last week heard how both companies are reaching for those goals.

CW Photo by J. Bartimo

The Exhibit Floor at Comnet '83

CW at Comnet '83

The problem with communications planning at Pitney Bowes, recalled Patrick J. Ryan, manager of data communications design at Pitney Bowes, was that it was too applications-oriented, resulting in network redundancy. "We were superimposing one network on top of another," he recalled at the show, which was sponsored by CW Communications, Inc.'s Conference Management Group.

Pitney Bowes had a voice electronic tandem network bridging several locations that needed to be upgraded. In addition, the firm had nationwide data communications needs, including support for its advanced field office automation system. Moreover, the Engineering Department wanted a computer-aided design and manufacturing system.

The company is currently seeking a voice-data private branch exchange (PBX) to integrate those two technologies. It is "cross-pollinizing" information between the voice and data departments to enable them to work together, Ryan said.

In the short term, the company wants to manage better the facilities it currently has in order to maximize returns from them. That could include developing some off-shift uses for the emerging network.

Long-term plans cover the creation of an "information utility" that will be transparent to both users and applications. Ryan pointed out that intelligence should be resident in the network, not the devices it supports.

The Pitney Bowes work plan is slated to define a statewide, 24-location local-area network in Connecticut. That "cornerstone of the entire network" will include a distributed PBX to augment several AT&T Dimension models already in place, Ryan reported, adding that he expects the PBX to be selected by the end of February.

Union Carbide

Meanwhile, Union Carbide, which has over 400 sales offices, warehouses, plants and distribution points, decided in 1977 to consolidate all the applications networks that had sprung up internally. After a presentation by IBM, Union Carbide decided to go with IBM's Systems Network Architecture (SNA).

At that time, the company had 230 interactive teminals and 100 remote job entry (RJE) stations. Now there are 3,500 interactive terminals and 350 RJE stations, according to Ken Yorgensen, senior systems analyst with the firm.

The company wanted SNA to help it set up an inventory control system that would keep it appraised of current stocks and act as a basis for internal billing. The conversion process to IBM's Vtam file management system and Synchronous Data Link Control protocol required some hardware changes, and it was necessary to tell users why the transition was being made, Yorgensen said.

In order to realize the desired network optimization, Union Carbide needed network standards as opposed to the "seat-of-the-pants planning" it had employed in the past, Yorgensen stated. Toward that end, it has done more analyzing of network utilization data.

The network billing plan for internal customers is being patterned after a service bureau approach.

Turning to benefits, Yorgensen claimed the multinational company will have saved $250,000 to $500,000 in communications costs by the end of this year.

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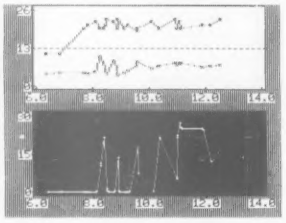

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Private Satellite Networks Seen as Positive Alternative

By Bruce Hoard
CW Staff

NEW ORLEANS — Private satellite networks are providing new communications alternatives for companies that were previously locked into fixed-trunk, node-by-node switching, according to Dr. Eugene R. Cacciamani, president and chief executive officer of Macomnet, Inc.

Cacciamani made his remarks at the Communication Networks Conference & Exposition held here last week by CW Communications, Inc.'s Conference Management Group.

Citing "dramatic changes" in satellite and communications technologies in the late '60s and early '70s, Cacciamani called the CATV industry an example of what can happen when satellites are married to communications technology. "The CATV industry exploded," he declared.

Satellite networks offer improvement over fixed-trunk, node-by-node switching by providing the ability to switch trunks for maximum efficiency, Cacciamani explained. He lumped satellite networks with public telephone companies, regulated special common carriers, satellite communications carriers and value-added networks as network alternatives for today's communications-intensive companies.

The proliferation of choices combined with deregulation in the communications industry has left users in a quandary, Cacciamani commented. Potential builders of private networks have to consider such stumbling blocks as staffing, maintenance and network management — tasks previously the responsibility of common carriers.

The Early Years

Early communications satellites were little more than "passive repeaters," he said, referring to Telstar, launched in 1962, and Syncom 3, launched a year later. Syncom 3 held between 100 and 200 telephone circuits; by the early '70s, satellites were handling 10,000 telephone circuits. Today, the number handled by C- and Ku-band satellites is about 15,000.

C-band satellites transmit in the 6 GHz range and receive at 4 GHz. Cacciamani said they are prone to interference from other transmissions, making it necessary to locate earth stations outside metropolitan areas.

Ku-band satellites send in the 12 GHz range and receive at 14 GHz. They are not affected by competing signals and earth stations may thus be placed in metropolitan areas. However, they are susceptible to adverse weather conditions such as rain.

Time division multiple access (TDMA) transmission is another popular satellite technology. The TDMA concept is used by backbone trunking networks, networks that commonly employ C-band transmission, Cacciamani said. TDMA acts on a time division multiplexing basis and requires that all stations be synchronized with each other to avoid transmission collisions.

Once satellite links have been established in a private network, the problem of local distribution remains. Cacciamani suggested several techniques to cope with it: point-to-point microwave transmission, microwave packet radio communications, CATV networks and fiber-optic cable. He said fiber-optic cable and twisted-pair cable are viable media for intrafacility communications.

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Micro Termed Positive Influence on Computing

By Bruce Hoard
CW Staff

NEW ORLEANS — Personal computers have revolutionized the rules of computing while improving on mainframe and minicomputer technologies, R. Rembert Aranda told attendees at the Communication Networks Conference & Exposition (Comnet '83) here last week.

Aranda, who is manager of strategic planning for Digital Equipment Corp.'s Office Information Systems Group, repeatedly gave examples of how personal computers are superior to large shared mainframe and minicomputer-based systems. "The personal computer is not just smaller, it's different," Aranda claimed at a session of the conference sponsored by CW Communications, Inc.'s Conference Management Group.

Large systems are expensive and must be used almost continually in order to be cost-justified, while personal computers may experience downtime as high as 80% and still be cost-justified, he observed. Large systems are predicated on "user compromise," meaning they can not be user-tailored like microcomputers.

CW at Comnet '83

Moreover, Aranda said, the impact of change is more dramatic in a large system environment than in a personal computer environment.

Aranda pointed out that an almost unlimited number of applications software packages are available for micros, while mainframe and minicomputer systems have far fewer. Micro users are bounded only by their ability to load and unload floppy diskettes, he said.

Applications development may take over a year for large systems, he said. Even then, the applications may not be appropriate for end users because technical development staffs sometimes fail to understand the business requirements of the applications in question.

"The process is DP- and [management information systems-] driven," he declared. Personal computer users, on the other hand, may write their own software, tailoring it to their specific business needs.

However, there are pitfalls for micro users. Aranda noted that end users must assume the role of the systems manager — a role to which they are neither accustomed nor trained. There are also limits on the size of applications programs that can be executed and vendor software support is not good.Beyond that, software protection mechanisms may make it difficult to alter software, he observed.

In the immediate future, personal computers will be deployed as standalone units 75% of the time and as network workstations the other 25%, Aranda claimed, adding they will be important as data and document transfer devices when linked to networks.

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Office Workers Want Micros, Speaker Notes

By Bruce Hoard
CW Staff

NEW ORLEANS — The growing popularity of personal computers has put them in demand by office workers, Lou Vogel, vice-president of the Communications Research Group in Baton Rouge, La., said here last week.

Discussing the use of personal computers as network workstations at a session of the Communication Networks Conference & Exposition (Comnet '83), Vogel maintained that "personal computers can be used to distribute the data processing instead of distributing access to the data."

According to Vogel, the disadvantage of using micros as workstation centers on their limited I/O capabilities, lack of software, the excessive amount of keyed-in data they require and the "fairly limited" amount of general storage they employ. In addition, micro use can lead to increased localized control and therefore decreased companywide control of computing resources, he noted.

The vice-president described what he called "file batching," whereby the personal computer is linked to a larger computer, sending files to and receiving files back from it. He said the asynchronous communications port common to most personal computers can be linked to the outside world via standard dial-up lines through the use of a modem and communications software.

The communications software should be hearty enough to withstand a noisy operating environment and capable of transferring binary and text files and commands between systems. It should also be efficient, provide multiple buffers and support full-duplex communications, he maintained.

There are still more drawbacks, Vogel warned. Information sharing is not interactive at the record level and the error checking provided by some software may be partially redundant in certain hardware environments.

Speed Held Major Factor In Mux, Modem Selection

By Jim Bartimo
CW Staff

NEW ORLEANS — "Speed is addictive," James Michaels, multiplexer product manager for Timeplex, Inc., told attendees at last week's Communication Networks Conference & Exposition here. Michaels and John C. Parnell, modem product manager for Timeplex, spoke about the present and the future of modems and multiplexers.

The speed to which Michaels referred is that with which multiplexers transmit and receive digital information over telephone lines. Users of both modems and multiplexers always seem to want faster and faster transmission rates and will seldom stand for a cutback in speed, he said.

"The three laws of networking," Michaels said, "are networks never get smaller, networks never get slower and networks never stay the same."

It is for this reason that when Michaels looked at the future of networking, he saw a unified network management system that in addition to combining data and voice networks will increase efficiency, control and speed. "The traditional solution [to networking] has been separate data time division multiplexers and voice time division multiplexers," Michaels said. However, with voice costs rising, only an integrated system will be economical in the future, he said.

In addition to increasing speed and lowering networking costs, an integrated network system also offers control of data links, modems, multiplexers and switches. "Most networking today is driven by computers, which leads to inefficient bandwidth utilization, misuse of the computer and single vendor limitations," Michaels said."We want centralized network management, centralized fault diagnostics, universal compatibility with terminals and computers and efficient resource utilization."

Integration and higher speeds are two factors also dominant in the current and future states of modems, according to Parnell. For instance, the future outlook for switched network modems is higher speeds, reduced costs and integration.

A switched network modem offers such functions as automatic dialing and logon procedures. The modems operate at half- or full-duplex at asynchronous speeds of 2,400 to 4,800 bit/sec at full-duplex and require a telephone, Parnell said.

Switched network modems will soon be simplified and no longer strapped by dip switches in the hardware. "The day is coming when you can configure a modem from the terminal," Parnell predicted.

Also on the horizon for switched network modems is internal testing that will eliminate searches for breakdowns in the network and allow the user to know immediately where a breakdown has occurred.

For private-line modems, data compression will allow line speeds as fast as 25K bit/sec to be achieved. "Data compression is the most important thing for the next five years," Parnell noted. "It will allow modems to operate at speeds higher than they are rated for."

CW at Comnet '83

Private-line modems are currently offering speeds of 9,600, 14.4K and 16.2K bit/sec in the synchronous, full-duplex mode. These modems also offer multidrop capabilities along with diagnostics, dial back-up, multiport options and data encryption.

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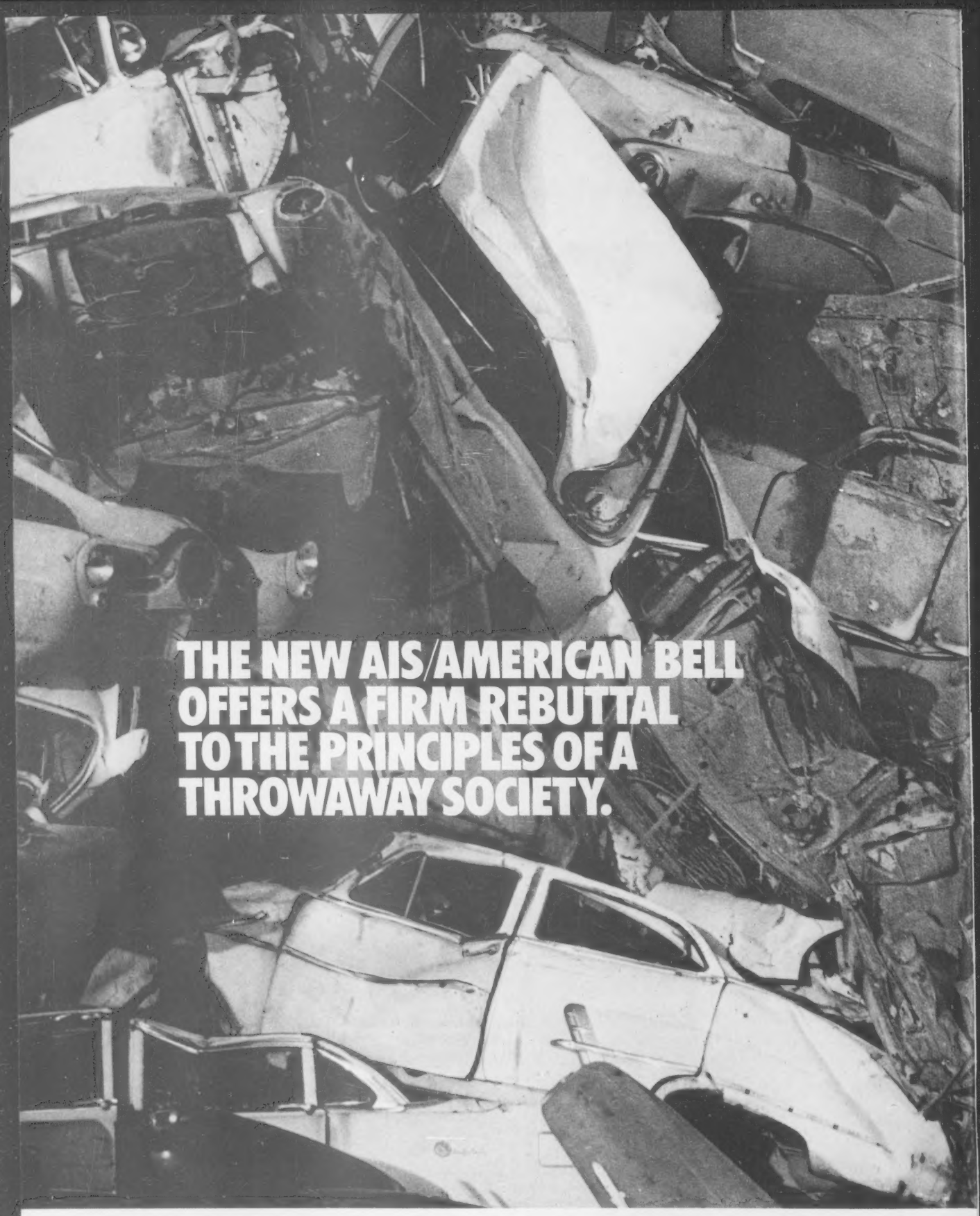

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At All-Star Game

Media to Pick MVP with DPS 6

LOS ANGELES — When the voting to name the Most Valuable Player (MVP) takes place at the National Basketball Association All-Star Game here Feb. 13, a computer will be on hand to tabulate the results.

Some 200 media persons will use punch cards to vote on the game's MVP.

The vote counter will be a 256K-byte Honeywell, Inc. DPS 6/32 minicomputer whose courtside configuration will include four CRT terminals, 26M bytes of disk storage, a 500 char./min reader and a 160 char./sec matrix printer.

The system is reportedly self-checking, capable of weeding out duplicate entries from the same person, and able to read cards inserted upside down.

Honeywell has been providing computers to compile MVP ballots for the past six years, delivering quick election results to sports fans. In last year's game, the Boston Celtics' Larry Bird won the prestigious award.

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—Riley Jackson
V.P., Information Systems
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Datapoint pioneered the concept of local networks when the ARC was introduced more than five years ago. Now there are more than 4,000 ARC systems in use, far more than any competitive system, and an experienced service organization supports them worldwide.

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Or write Datapoint Corporation, Marketing Communications T41CW, 9725 Datapoint Drive, San Antonio, Texas 78284.

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Interface To Meet In Miami

FRAMINGHAM, Mass. — The 11th annual Interface Conference will be held in Miami March 21-24. It is sponsored by the Interface Group.

The conference portion will feature 200 experts offering their knowledge in sessions on such topics as local-area networks, front ends, modems, multiplexers, policy and regulatory issues and office systems integration.

On the exposition side, 250 vendors are expected to be represented, a spokesman said.

The second annual industry awards banquet will be held March 22.

The registration fees range from $10 to $270, depending on the number of days one attends and conference/exposition selection.

More information is available from the Interface Group through P.O. Box 927, 160 Speen St., Framingham, Mass. 01701.

Probe Seminar On Messaging Slated for N.Y.

MORRISTOWN, N.J. — Probe Research, Inc. will sponsor a seminar entitled "Electronic Messaging: The New Wave in Telecommunications Information Management" in New York April 6-7.

The seminar will present the full range of messaging services and applications that are now available to managers, according to a spokesman.

Topics will include display pagers, cellular radio, information loop filtering and national and international services. Other topics include the following: voice mail, text mail and integrated message offerings, accordig to the spokesman for Probe Research.

The registration fee is $750 for individual attendees and $675 for additional attendees from the same organization.

Probe Research can be reached through P.O. Box 590, Morristown, N.J. 07960.

Managers on the Move

SHAWN B. KENDALL has become director of information resource management for Phelps Dodge Corp. in Phoenix.

Kendall will direct and coordinate data processing, communications, word processing and all of the related activities for mineral extraction systems in the Western Regional Data Center.

He joined Phelps Dodge in 1976 as a test engineer in the Division of Environmental Engineering & Research at Tucson, Ariz. In 1978 Kendall was transferred to the Morenci Branch and installed as systems engineer in charge of the Systems Engineering Department.

Kendall became management services supervisor for the Morenci Branch in July 1979 and in June 1981 was named assistant director for research and development in IRM-West.

He holds a B.S. degree in chemical engineering from the University of Arizona.

•••

JAMES A. McCOY has been appointed director and general manager of information services for the Management Systems Group of United Energy Resources, Inc. in Houston. McCoy will be responsible for directing and coordinating information systems research, planning, analysis, design and implementation.

McCoy joined United Gas Pipe Line Co., United Energy's interstate natural gas transmission subsidiary, in 1976 as a senior systems analyst. In 1980 he was appointed assistant to the executive vice-president and chief financial officer of United Energy, the postion he held until his most recent appointment.

McCoy received a B.A. degree in accounting from the University of Houston.

•••

CHRIS VEASEY JR. has been appointed to the position of branch chief, management information systems for Solar Energy Research Institute.

Veasey formerly served as Manager/Northern Operations for Denver's Regional Transportation District (RTD) and prior to that he was Supervisor of Financial Reporting for RTD.

Currently pursuing his doctoral degree at the University of Denver, Veasey received a master's degree in public administration from the University of Denver and an MBA from the University of Dayton.

He earned an undergraduate business degree from Syracuse University.

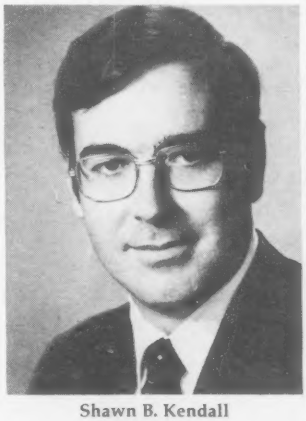
STEPHEN K. SMITH JR. has been appointed director of management information systems development and CHARLES SHORTER has been promoted to technical services department manager at Richfood, Inc., a retailer-owned wholesale food distributor in Richmond, Va.

Smith formerly served as programmer/analyst and was promoted to project leader in the Systems and Programming Department the following year. In 1979 he became the manager of that department.

Smith holds a B.S. in business administration from William and Mary College and both an M.S. and MBA from Virginia Commonwealth University.

Shorter will be responsible for systems programming, data base and data communications activities, including data communications hardware and software. He joined Richfood in 1981 as a data base coordinator for the Systems and Programming Department.

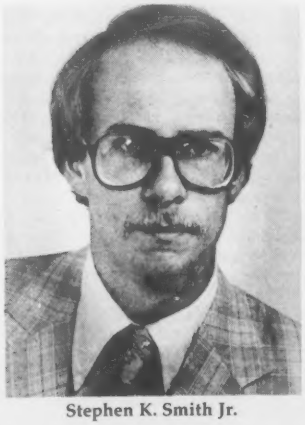
Prior to joining Richfood, he was technical services manager for the Crompton Co., a textile manufacturing firm. He attended Virgina Military Institute.



Shawn B. Kendall

Chris Veasey Jr.

James A. McCoy



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Micro Buyers Seeking Computer Literacy: Study

NORWALK, Conn. — The quest for computer literacy is and will continue to be the impetus for home computer sales, according to a recent report from International Resource Development, Inc. (IRD).

While current buyers are purchasing home micros to play video games and/or to provide their children with a new learning tool, 50 million to 80 million people will purchase home computers over the decade for the sole purpose of learning how to use them, the study estimated.

"Computers have a certain mystique about them as well as a frightening element having to do with threatening people's job security. The fact that a basic computer can now be purchased for less than $100 will encourage even the most hesitant individuals to experiment," the study said.

However, the study cautioned against assuming the inevitability of a "micro-in-every-home" revolution after the intial literacy stage. It questions whether applications can be found to make the use of the home computer an everyday occurrence. If not, users will let their micros gather dust.

What the industry needs, the study suggests, is a "[Visicorp's] Visicalc-of-the-home," a software package that consumers simply can't refuse.

The solution is expected to come from several sources, including users themselves, who are expected to provide insights to their needs through home programming attempts. Other contenders include the following:

- Integrated software that combines diverse activities such as word processing and number crunching.
- Expert systems that give "first-cut" advice on a variety of subjects, but is not expected to debut until the end of the decade.
- The development of natural language programming.

The report suggests that many suppliers are "pinning their profit hopes" on sales of add-ons to consumers, since the market for the computers themselves is becoming very price competitive.

This aftermarket is not expected to emerge for another five years, at which time computer-literate consumers will be looking to upgrade their systems for practical applications. The study predicted a rough time for small suppliers and major retail chains that are looking to capture some of the home computer market.

"Microcomputers in the Home"(No. 537) is available for $985 from IRD, 30 High St., Norwalk, Conn. 06851.

On May 18th, *Computerworld* launches its first communications satellite . . .

. . . satellite publication on communications, that is.

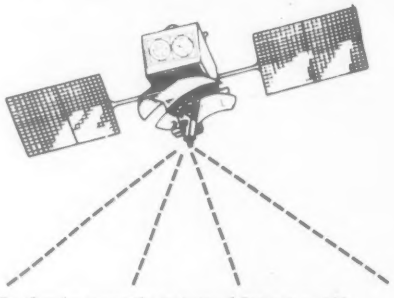
We are launching a new publication devoted to in-depth coverage of the broad spectrum of voice, image and data communications. *Computerworld On Communications* will examine communications issues, technology and applications from a systems perspective.

We recently did a study of *Computerworld* subscribers to determine their level of involvement and interest in communications. Of the 84% now using or planning to use communications equipment and services, 72% are personally involved in its selection and/or implementation. We found that these subscribers depend on *Computerworld* for communications information and prefer its coverage by more than 4 to 1 over the next publication in the field. This segment of our audience has a critical need for in-depth information on the constantly changing technology of communications.

As *Computerworld* expands its weekly news coverage of communications with interpretive information on products, equipment and services, *Computerworld On Communications* will complement that coverage with focused attention on the boarder issues facing business communications users.

Computerworld On Communications will keep readers current on changing trends in the design, acquisition, operation, and optimization of corporate communications facilities. It will look at communications and networks from a systems perspective that relates technical capabilities with corporate goals.

In the two issues for 1983, *Computerworld On Communications* will apply the proven editorial resources of *Computerworld* to the area of communications networks. It will look at the implications of enhanced communications within the business organization together with the impact on established systems operations.



So, if you're among the majority of *Computerworld* subscribers who are personally involved in the selection and implementation of communications equipment and services for their organization, you'll find *Computerworld On Communications* a valuable addition to the *Computerworld* family of special publications.

As a Computerworld subscriber, you will automatically receive the two 1983 issues of *Computerworld On Communications* as part of your subscription. If you're not already subscribing to *Computerworld*, call *toll free* 800-343-5730.

Remember to look for *Computerworld On Communications* on May 18th and again on September 28th (advertising deadlines April 8th and August 19th).

For advertising information on *Computerworld On Communications*, call Bill Dwyer, National Accounts Manager at (617) 879-0700 or your local *Computerworld* sales representative.

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Spreadsheets For Micros Inventoried

DELRAN, N.J. — Over one million electronic spreadsheet packages will be running on personal computers by the end of 1983, making them the most popular business applications packages for the smaller machines, according to Datapro Research Corp.

In a 19-page report titled "All About Electronic Spreadsheets," Datapro has assembled information about 32 commercially available electronic spreadsheet programs from 27 vendors, including the most recent "second-generation" programs.

Considering the productivity improvements possible with spreadsheet packages, Alan T. Hirsch, associate managing editor for Datapro, said, "It's not surprising that the number of electronic spreadsheet programs in use is expected to double next year."

The Datapro report is intended to enable current and perspective purchasers of electronic spreadsheets to compare competitive programs and select those that best meet their particular requirements. The 32 different programs listed in the report range from basic programs to software such as Context Management Systems' MBA program, which integrates word processing, data base management, graphics and other functions into a spreadsheet program.

Other Vendors

Other vendors covered by the Datapro report include Visicorp, Software Products International, Information Unlimited Software, Sorcim Corp. and Osborne/McGraw-Hill Publications Co.

Each spreadsheet program listing provides data in 50 categories, including such system characteristics as maximum usable memory; screen characteristics; edit functions such as cell justifying and page scrolling; calculations performed, including percentage, logarithmic and trigonometric; file handling; print characteristics; user support features; and pricing and installation data.

The report also includes a list of questions for users to ask regarding system support and documentation before making a purchase decision. A glossary of technical terms is also included.

Copies of "All About Electronic Spreadsheets" are available for $19 each from Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Resistance to Technology Cited

Micro Sales Seen Checked Until '90s

By Patricia Keefe
CW Staff

WALTHAM, Mass. — Don't be fooled by the personal computer advertising blitz currently sweeping the country. Video game popularity to the contrary, it will be at least 10 more years before home computer sales take off, Assistant Prof. Lynn DeNoia of Bentley College believes.

The main barrier to home computer sales is people's resistance to new technology, often a result of frustrating experiences with computers in other facets of their lives, according to DeNoia, who is coordinator of Bentley's master's degree program in computer information systems. DeNoia is involved in several projects at the college involving personal computers, including plans to set up an experimental network using coaxial cable to connect a variety of different microcomputers using Digital Research, Inc.'s CP/M.

Home computers are likely to remain a "fad" over the next 10 years, DeNoia said, until a generation of computer-literate children impact the market, causing sales to jump. "I know where people have bought home computers for their kids and become intrigued themselves. But there is a level of intimidation here for someone who has never used a keyboard before and here's this 12-year-old making it dance," she said.

Advertising is having an effect, DeNoia conceded, but "a lot of people pay money, have this box and then they don't know what to do with it. They think it's a viable tool for investment, but the largest investment needed to utilize it isn't money, it's time. You need to play with it to learn its capabilities."

Technical Inferiority Complex

Parents aren't the only ones coping with a technical inferiority complex. Teachers, too, are becoming "victims" face to face with the "micro monster" and its effects.

"It's happening in the schools where kids know more than the teacher, who is afraid to touch the machine in front of a class of 40 students," Denoia said.

Another problem soon to face teachers is an even more pronounced disparity in learning readiness between those children who have been exposed to educational programming and those who have not. "You'll have kids who can't spell 'circle,' but they can punch a button and draw one," DeNoia said.

With early exposure to the computer, "there is the potential to learn sophisticated concepts which, while not yet verbalized, are used long before the child is introduced to formalized learning."

This could change educational concepts, she said. "Instead of having to 'do' education to kids, they could be taught from the discovery point of view." Other side effects include improved dexterity and eye-to-hand coordination, DeNoia noted.

It is ironic that many practicing teachers resist the computer, while displaced teachers often turn toward high-tech industries in their search for new careers, DeNoia pointed out.

Another situation in which an unwilling audience is coming face to face with home computers occurs when the home becomes the office. Although "people talk a lot about this [and] not much is happening, there is still resistance from large companies who fear a loss of control over the home worker," she said.

CW Photo by P. Keefe

When more children are exposed to educational programming, DeNoia warns, 'you'll have kids who can't spell "circle" but they can punch a button and draw one.'

Intercomputer Dialogue Seen Key To Future Communications

WALTHAM, Mass. — Intercomputer dialogue is the key to future communications, according to Bentley College Assistant Prof. Lynn DeNoia, who believes personal computers will play an increasing role in facilitating this type of activity. Barring the way, however, is "a host of compatibility and privacy problems."

One advantage of using a personal computer with floppy diskettes is that no one can break into files at will. On the other hand, "the minute I hook up into any network, such as public service networks, I have a very large concern about someone monitoring my particular usage and reference — even though it has to be done in order to charge me," DeNoia said.

Federal intelligence organizations can easily track people who use a computer. "I don't even want to think about what they could find out," DeNoia said.

The question for home computer owners then becomes whether the benefits of subscribing to a service are worth the risk of surveillance, according to DeNoia. However, for those who want to use services, there are defenses such as the two-key (public encoder, private decoder) system and the National Bureau of Standards' Data Encryption Standard.

If security is not a concern, network compatibility may well be. With so many different personal computers attempting to interface with so many different mainframes, noncompatibility could easily create problems. Although standard protocols already exist in this area, the problem is providing software that is flexible enough to allow micros to interface with mainframes, DeNoia said.

While most micros have Ascii character sets, many IBM medium-size and large computers are based on Ebcdic. Institutions that have IBM mainframes and expect to interface with home micros will have to purchase a character converter box for $3,000 to $8,000, DeNoia said.

"The software we have now is inefficient and slow. There should be a compatibility mode that will read either set," she commented.

Micro owners may need two sets of phones, since data and voice transmissions often require separate facilities. Even systems that use the same lines usually do not allow simultaneous transmission, DeNoia said.

With those phones, users probably will have to purchase direct-connect modems. Acoustic couplers will be phased out unless the telephones soon to be offered by different vendors offer standard-size receivers, she predicted.

DeNoia also expressed the concern that "if we are stuck with the programming languages we currently have, I don't foresee any breakthroughs in the kinds of things we can do."

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Innovators in Info Services Seen Succeeding

By Robert Batt
CW West Coast Bureau

MALIBU, Calif. — Organizations that expect to achieve a competitive advantage by developing a strategy based on information services technology will need to manage risk, reward and the probability of success more carefully than in the past.

That is the major conclusion of a recently released paper entitled "Gaining Competitive Advantage — A CEO's Perspective," researched and coauthored by Victor Janulaitis and Richard Mason. Management consultant Janulaitis, a former executive at IBM and Touche Ross & Co., and Mason, professor of business and public administration at the University of Arizona at Tucson, asserted that an information services strategy can lead to new market opportunities as well as the traditional cost-reduction systems.

The successful companies, they argued, will be innovators. Any organization that looks only at a "simple" application of office automation, for example, and does not see new ways to link it to its basic business units may be missing an opportunity.

Integrating information services technology involves risk, the authors admitted. "You do it in order to gain a competitive advantage consistent with the level of risk you can successfully manage. The challenge is to develop a strategic plan for achieving this objective."

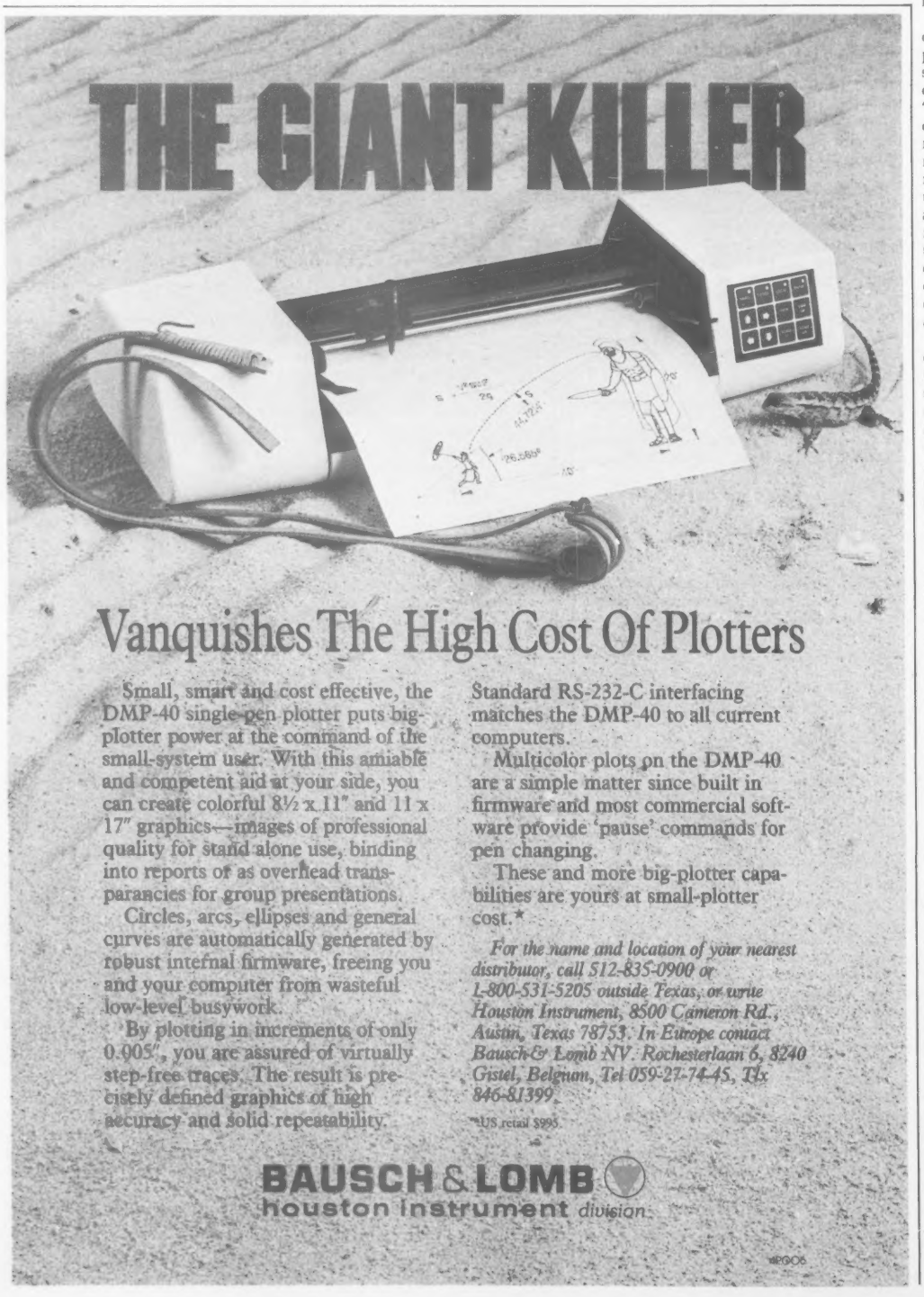
Such a strategy, according to the paper, must achieve a proper balance between growth, control and technological innovation. The chief executive needs to know, "What is the potential bottom line impact of the application of information services technology?" For the answer to this, managers must look at the organization's application systems, exploring such factors as strategic planning, decision support systems, the organizational maturity of the computer, communications, user and management team and the existing direction, pace and momentum of implementation.

Any organizational change entails two equally punishing pitfalls — one assuming too much risk, the other assuming too little. "For example, with too little change, an organization does not stay current with technology. It will start to face risks such as obsolete and unsupported software, inability to change to meet new business demands and the inability to recruit high-caliber personnel and technical resources to support its existing systems," Janulaitis and Mason pointed out.

On the other hand, if an organization undertakes too much change it incurs excessive risks. Janulaitis and Mason cite as an example the merger between Pan American Airlines and National Airlines: "The merger required consolidation of two airline reservation systems. Pan Am was incapable of handling the increased volume and complexity. How much business Pan Am lost is unknown; but its over-ambition in this case likely contributed to many of its current problems."

To gain a competitive advantage, the paper continues, companies need to look at the technological dependence and maturity of the industry and their organizations and review the systems that are the focus of their future competitors. The rate at which the industry is absorbing technology, the paper adds, dictates the overall risk the organization faces from changes caused by information services technology.

The absorption rate is based on two factors: the depth to which the technology is an essential component of the industry and the extent and sophistication with which the industry has adopted the technology. "This data can identify the new services a financial service organization is going to provide, or the new products which an office automation company is going to implement, or the new directions which a manufacturing or distribution organization can take to improve productivity. From this a plan for the information services function can be created."



Calendar

Week of Feb. 27

Feb. 28-March 2, Washington, D.C. — **Structured Analysis/Design Workshop.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

Feb. 28-March 2, New York — **C Programming Language Workshop.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

Feb. 28-March 2, New York — **Computer Contracts.** Contact: Ruth K. Dargis, Brandon Consulting Group, Inc., 1775 Broadway, New York, N.Y. 10019.

Feb. 28-March 4, Pittsburgh, Pa. — **Design Techniques Workshop.** Contact: Bill Schoonmaker, Brandon Systems Institute, 4720 Montgomery Lane, Bethesda, Md. 20814.

Feb. 28-March 4, New York — **Structured Design Workshop.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

Feb. 28-March 4, Scottsdale, Ariz. — **Fourth Annual Conference on DP Performance Management.** Contact: Loretta Dryden, Applied Computer Research, P.O. Box 9280, Phoenix, Ariz. 85068.

March 2-4, Washington, D.C. — **Teleprocessing Software: An Introduction to Concepts, Systems and Applications.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 2-4, Washington, D.C. — **Information Systems Planning: A Structured Approach.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 2-4, New York — **Structured Systems: Analysis, Design and Programming.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075

March 3-4, New York — **Computer Networks: Protocols and Standards.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 4-6, Harvard, Mass. — **Computers and Personal Values: Sharing from Experience.** Contact: Arthur Fink, B614, Prince St., Wilton, N.H. 03086.

Week of March 6

March 7-8, Chicago — **User-Friendly Information Delivery.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 7-8, Washington, D.C. — **Data Administration: Successful Techniques.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 7-8, Chicago — **Optimizing Source Data Entry: Design Techniques.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 7-9, New York — **Data Communications: An Introduction of Concepts and Systems.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 7-9, Chicago — **Data Communications: Effective Network Design.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 7-9, Washington, D.C. — **Systems Analysis and Design: Concepts and Effective Practice.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 7-9, San Francisco — **Structured Testing: Tools and Techniques.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 7-9, San Francisco — **Data Base Management Systems: A Comparative Analysis of General-Purpose Systems.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 7-10, New York — **Computer Auditing.** Contact: Information Systems Resources, Inc., 1444 Balsam St., St. Paul, Minn. 55122.

March 7-11, San Francisco — **How to Develop an Effective Long-Range Data Processing Plan.** Contact: Keston Associates, 11317 Old Club Road, Rockville, Md. 20852.

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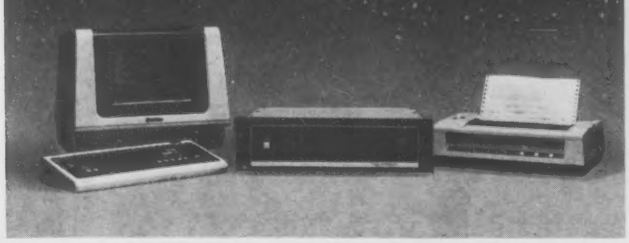

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EDITORIAL

Talk Is Cheap

When the show was over, the mood among high-tech executives visited in Boston recently by President Ronald Reagan was distinctly upbeat. The president is committed to high tech, they said; we have his ear.

But when asked to comment on the president's proposed and actual budget cuts that have had a clearly negative impact on computer education and training programs, most of the executives balked. They also blanched a bit when asked to comment on the onerous federal deficits that are apparent features of Reaganomics.

The president had come to Massachusetts to show the rest of the country how an unfettered entrepreneurial spirit can propel a former smokestack region into prosperity and economic stability. He heaped praise on the high-tech moguls of the Massachusetts High Technology Council and told them the luster of their successes should be a beacon for the rest of this troubled nation to follow. He was like a high priest, blessing what he perceived as his flock of altar boys.

There's trouble in the parish, and the president did a marvelous job ignoring its underpinnings.

Construction of the Digital Equipment Corp. assembly plant Reagan visited was made possible by federal funds, both directly and indirectly. The inner-city industrial park where the plant is located has $7 million worth of federally funded roads. DEC's $3 million plant investment was financed via the tax-free industrial-revenue bond program, one that Reagan tried to axe.

The number of employees at the DEC plant is not likely to increase in the near future, for DEC has imposed a companywide hiring freeze because of the prolonged recession. The company has been hit with two consecutive quarters of earnings declines, with at least one more down quarter forecast for the immediate future. DEC is by no means alone.

The federally and privately funded computer training center he visited during his stay, also in the inner city, has seen its budget slashed so severely in the past year that the number of trainees there has been reduced by more than half.

Talk is cheap. The costs of technical education and training are not.

Yet the president seems uncommitted to upping the federal ante in shouldering the increasing costs of higher education, clamoring instead for tighter controls over the vast minority of students who default on their student loans. Our institutions of higher learning, he said, would do well to be run more like businesses. Such thinking constitutes a dangerous flight into free enterprise fantasy.

Yes, the computer industry is probably the healthiest patient in a ward full of anemics. But the industry is not an island unto itself. The tremendous battering being weathered by America's primary industries and its banks and small businesses has clearly hit the computer vendors. One has only to cull IBM's earnings for 1982 from the overall profit picture to see that all is not roses with the computer companies.

The president tells us that "America is on the mend." But the troubled financial markets, armies of unemployed, idle plants and staggering federal deficits tell another story.

A strange recovery, indeed.

LETTERS

Meeting a Demand

The lack of demand for voice recognition products discussed in "Fewer Firms Developing Voice Systems: IRD" [CW, Jan. 17] is due to the failure of the firms developing these products to aim them at the right market.

Today's new and innovative technological developments often require the creation of a demand for a product rather than creating a product to meet a demand.

Yet there is a wide segment of the population throughout the world that would benefit enormously from a speaker-independent voice recognition product, namely, the millions of hearing-impaired individuals who could make telephone calls, follow television and movies more closely and communicate more effectively in everyday conversation with other individuals if there were such a product on the market.

Perhaps I am biased because I am deaf, but I have been aware of the potential of such devices for the past decade. I am always considering how much better I could carry out my job or aspire to a better one if I could carry on a normal phone conversation.

As a case in point, consider what a better job the National Captioning Institute could do in captioning the live telecasts of news programs with such a device. There is also the case of the deaf lawyer who argued a case before the U.S. Supreme Court last year using a CRT hooked up to a computer that translated the symbols being inscribed by the court reporter's machine to follow the judges and other attorneys' conversations.

Surely a market potential of millions would be enough of an incentive for these firms.

Bill Coombs
Systems Development
Idaho Power Co.
Boise, Idaho

Focus on Personal Needs

While reading the article "What Boosts Worker Morale?" [CW, Jan. 24], I found myself taking issue with its scope and tone. I manage DP professionals and find that the article does not address itself to the unique characters of people in the business. Many of the tips given are so generic that they could be applied to the word processing pool or a professional sports team as well as to DPers, with about the same results.

Perhaps you could consider a more comprehensive article that addresses the process of managing in light of the personal needs of the individuals in the data processing field. My personal experience has been that managers achieve far greater productivity and higher employee morale by tuning into these needs:

- The need for personal expression in a work assignment.
- The need to be intellectually challenged.
- The need to exercise creative thinking.
- The need to be developed as a professional.
- The need to integrate personal goals with department/company goals.
- The need for an environment that encourages risk taking.

The list goes on. If software development and management information systems managers were to focus on these needs, they would find the environmental considerations mentioned in the article weighing less in the equation for improved productivity and employee morale.

It's about time we understood as much about our people as we do about our technology.

Richard J. Cowley Jr.
Senior Director
Support Services
National CSS
Wilton, Conn.

LECHT ON SCIENCE / Charles P. Lecht

Corporate Shacking Up: The 12% Solution

That IBM's purchase of 12% of Intel Corp. serves to strengthen further both is beyond question. Thus, speculations to the effect that some other motive underlays this happy union — for example, the compelling desire to fulfill a corporation's patriotic duty to fend off alleged assaults by the Japanese upon our supremacy in electronics — are a bit much to take.

Base canards such as this rank in credibility with the suggestion that Americans have a duty to pay more for their data processing than required as a sign of loyalty to their country. (I wonder how we would react if the Japanese suddenly proclaimed their intention to make us a "free gift," as they say in consumer banking, of all the electronics we wanted.)

Anyway, three cheers for the management of IBM and Intel that consummated the "arrangement." This is surely creative corporate shacking up at its most exalted.

In IBM's case, kudos for its foresight in assuming a position of responsible partnership within an American corporate/scientific gem whose replication, were it possible to effect one, would have cost orders of magnitude more than what, in the event, they actually paid.

In Intel's case, let us acknowledge the particular genius of its timing. The capital-intensive nature of the semiconductor business makes companies like Intel especially vulnerable to takeovers unless there is a significant, built-in and collaborating marketplace for their output. What better marketplace than IBM, which is at once a client and owner of significance?

So it's a good deal for both — but its happening does raise some sticky issues. If we could set aside our conveniently self-exculpatory fixation on the Japanese, we could (and here intend to) address those issues without prejudice to any party concerned.

'Twelve percent ownership in a major corporation isn't something to be sneezed at. It's enough to put a person from IBM on Intel's board — a person with, say, enough purchasing power to command the attention of his most objective board colleague. Under such circumstances, it's hard to envisage Intel's continued full independence: But it is imperative for us to reserve judgment.'

Serious students of the computer industry cannot help but notice that IBM, our industry flagship, has recovered its daring after 13 singularly unilluminating and suffering-saturated years in the ring with the Justice Department.

Bad Times for Others?

This could mean bad times for the other manufacturers, assuming IBM's faith in the viability — not to say respectability — of an aggressive, competitive approach to its natural marketplaces has been restored. Intel, for its part, has been a major supplier to numerous companies whose products are in direct competition with IBM's. Furthermore, many new home-computer companies employ Intel's chips in their products.

But, we are told, Intel will remain an independent company and its commitments to secrecy to all its clientele will remain inviolable. That the deal includes language barring IBM from acquiring more than 30% of Intel "gilds the lily" of the benign image of the deal sought by both companies, suggesting some sort of ultimate barrier to limit the scope of the former's influence.

But 12% ownership in a major corporation isn't something to be sneezed at. It's enough to put a person from IBM on Intel's board — a person with, say, enough purchasing power to command the attention of his most objective board colleague. Under such circumstances, it's hard to envisage Intel's continued full independence: But it is imperative for us to reserve judgment.

The IBM Board Member

Nonetheless, I am led to wonder about the role of the IBM board member whose position demands all manner of responsibilities to Intel, its shareholders, the government — and IBM. Without full disclosure of all important internal matters to him, we can only presume that devices will have to be put in place to limit his liability as a board member. Such devices could include blindfolds, earplugs and, ultimately, coma inducers (where the tempo and content of the meeting itself failed to procure this result at the critical moment).

I can see it now. His Sony Walkman on and blindfolded, an IBM executive enters the Intel boardroom. Led stumbling awkwardly to his chair, he sits, the inspirationally deafening strains of *The Stars and Stripes Forever* creating discretion-assuring tremblers in his featherweight earphones. He gropes for his coffee, sips a bit and waits until someone provides a signal; one tap on the shoulder means the blindfold may be removed, two taps, the earphones. And the Intel board meeting begins.

First, of course, comes the distribution of the agenda, annotated by pictorial symbology. Preceding each agenda item are letter-size pictures of earphones and a blindfold. If either symbol contains an oblique through it, the usage of the corresponding inhibitory device upon the IBM-sponsored board member isn't required. Another board member, specially trained for the function, further annotates his own agenda to anticipate his need to provide the requisite shoulder signals at the end of a period of blindfolded silence for the IBMer, who otherwise might miss his cue to remove either or both his "peripherals."

Intel's board meetings will take place in an atmosphere ever more tempered by the New Federalism, wherein we all prove our loyalty by exhibiting disdain for big (thus bad) government and give our all to dismantling it wherever we may find it. With moral responsibility to oversee industry off-loaded from our regulatory agencies to the discretion of individual board members, they'll have to take especial care to tune in and out of agenda items as they sit around the table indicating, for the record, who was paying attention, who wasn't and which device was used — blindfolds and/or earplugs or induced coma (the ultimate weap-

(Continued on Page 30)

HUMAN CONNECTION / Jack Stone‡

DP Job Guidance at Colleges in Need of Repair

Like many other personnel development efforts around the data processing industry these days, projects dealing with the recruitment of college students seem to have fallen on hard times.

During interviews with college seniors, we learned that at least some campuses have apparently ignored or downgraded the serious guidance needed for pursuing a career in data processing. Yet if the shortage of up-and-coming DP manpower is all that great, one would reasonably expect that more could be done.

Pearl Marshall, a computer science major who attends a small private college, did not have the foggiest idea where to begin her job hunt but, fortunately, was too busy getting through her last year to worry about it. Her views were representative of the group.

"My immediate goal is to demonstrate aptitude and competence in the field by graduating with the highest possible grades. Even then, I understand that I won't be guaranteed a great job, but high marks will get my foot in the door!"

This is the fourth article in a six-part series, "Computers and the Collegians," coauthored with Joanne Barker.

Proper Selection of Courses

"Counseling students for a job in the industry should begin, I would think, with the proper selection of courses," she said. Yet my adviser was either not well versed in this area or too preoccupied to apply himself to my particular case. I had to design my own curriculum, which included both required and elective courses, based only on my unsure interpretation of the course catalog and the logical, but not authoritative, suggestions of a friend. After I submitted it to my adviser for review, all he said was, 'Sounds good to me' and rubber-stamped it.

"I have no idea of the specific jobs in industry that are available, where to get information about them or how to apply for them. I've heard there was a student placement office somewhere on campus, but no one has told me what it does or where it is or if I am even qualified to visit it.

"There are no fliers on the bulletin boards announcing openings for computer jobs and none of my instructors has ever said anything about what the job market is like."

Slugged Out the Plan

"So I am not at all certain that my choices for departmental electives or the sequence of my required courses are best suited to my future career," she said. "When I reflect on it, I do feel somewhat deprived, but I am so loaded down with work that I don't have time to feel sorry for myself. So I've slugged out the plan on my own, just as I've had to struggle through poorly written computer science texts. Several industry professionals I know say all of this is good practice for the 'real world' of data processing.

"I'm anxious to get out and to see what this world is like, so much so that I'm carrying a 21-hour work load to get my degree in the shortest possible time. And as I progress further into the field, I'm beginning to think that the content of my particular course selections may not be all that critical to the job hunt. After all, how could six upper-class courses in my department prepare me for the endless diversity of positions that I expect are out there? For this reason, I figure that to assess a student's suitability for a job, prospective employers are forced to look at the academic record first, then the professionalism displayed in the job interview and, lastly, course work — at least I hope it's that way.

"However, I'm not depending on grades alone to build up my resume. I intend to pursue vigorously a summer job in the field this year, one that will provide my first practical experience with computers in the industrial setting."

READER COMMENTARY /Roland K. Bowns‡

Who Owns Software Written Under Contract?

As a company manager, you hire a talented programmer to write software for a particular application. Sometime after the software is installed, tested and functioning properly, you find out that the person who wrote your program is marketing it to others, including your competitors. Can you get an injunction to prohibit him from further marketing activities? Can you sue for his profits and/or your damages? It depends on who owns the software.

Who owns the software? If the programmer in question is an employee, the firm owns the software because under the copyright law "work made for hire" doctrine [17 USC Sections 101 and 201 (b)] the company is the author.

However, if the talented programmer is an independent contractor rather than an employee, the software belongs to him, not the company, unless a written agreement between them specifically states that the work was work made for hire or otherwise provides that the company owns the software developed under the contract.

Employee vs. Contractor

What distinguishes an employee from an independent contractor? There is no black or white answer. However, a recent case [BPI Systems, Inc. vs. Leith (1981) 532 F. Supp. 208] is instructive. In it the plaintiff, a company, sought an injunction to prohibit the defendant, whom the plaintiff hired to write 12 programs, from marketing certain software.

The defendant wrote and produced the software at his own place of business on his own computer. He was paid an agreed amount for each program, and no social security or income tax was withheld from the payments to him. The company could accept or reject each program as finally submitted by the defendant, but the plaintiff had no right to control the manner in which the defendant performed the work.

The plaintiff gave the defendant some confidential documents to help him. Those documents contained a keyboard routine, an I/O routine and a stop/go/quit routine. After he delivered the 12 programs to the plaintiff, the defendant marketed software that was almost identical to the programs he wrote for the plaintiff.

The court concluded that the defendant was not an employee of the plaintiff. The court said the work was specially ordered and commissioned by the plaintiff, but there was no written agreement that the work was work made for hire. The defendant was enjoined from using the plaintiff's routines.

However, and this is the important point of the case, the defendant was not enjoined from marketing the 12 programs that he wrote. He had to develop his own routines in place of the plaintiff's routines, but the portions of the 12 programs he wrote are his, not the firm's.

Resolving the Problem

There are two ways for the firm to resolve the problem:

- Make the talented programmer an employee of the company. Then any software he develops during the employee/employer relationship belongs to the company, even if there is no written agreement covering software ownership. (Programs developed at home on his own time that are not directly related to the company's business are exceptions.)
- Put a work made for hire provision in the written agreement. Then the software developed pursuant to that agreement belongs to the company and can be copyrighted by the company.

The first alternative may not be satisfactory. The company may prefer to deal with programmers as independent contractors rather than as employees for reasons of cost and security. Also it is difficult to determine whether software produced at home or off-hours is produced within the scope of employment.

The second alternative is more promising. This alternative should be satisfactory in all cases in which the programmer will consent to it.

Including the provision in a written contract establishes ownership of the software developed pursuant to it.

Bowns is a staff counsel with the state of California's public employees retirement system in Sacramento, Calif.

The 12% Solution

(Continued from Page 29)

on employed by one board member upon another who shows signs of being unwilling to have his ears plugged or eyes blinded).

It's conceivable that topics may arise that no one can hear, supported by documents that no one can see, in which case first-echelon employees will have to convene to consider them. This could ultimately result in an American variation on the laudable Italian business form wherein a virtual board handles the problems at hand while the real board dines in splendor at, say, Windows on the World.

But enough of this mischief! Bring on AT&T, the Japanese and whomever. The new confederacy of Intel with IBM, boardroom problems notwithstanding, gives us pause to reflect: It certainly would be interesting if IBM bought 12% of Motorola, Inc. next time around.

Lecht is president of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

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DP Managers Pleased With Info Centers

ARLINGTON, Va. — The information center concept is alive and well at five firms whose DP managers recently discussed their successful implementations at the 1982 Infodata Systems, Inc. User Meeting here.

The panel consisted of Sam DeFazio of Gulf Research & Development Corp., Jim DeLong of Michigan Wisconsin Pipe Line Co., Bob Hutton of Union Carbide Corp., Valerie Martin of Sterling Drug, Inc., and Vijay Mathur of Blue Cross of Northeast Ohio. Harry Kaplowitz, executive vice-president of Infodata, moderated the discussion.

Discussing how the information center fits into their particular organizations, Mathur began by explaining, "At Blue Cross of Northeast Ohio we consider DP a manufacturing plant, producing bills or checks, while the role of the center is to provide services to the corporation and participate in setting its strategies."

"The Union Carbide [information center] was set up in support of IBM's CMS, primarily to provide engineers with productivity tools and let them know what additional DP tools are available," Hutton explained. "CMS has grown throughout the corporation but the role of the [information center] still is the same: it is there to help the users talk directly to the computer."

Martin noted that Sterling Drugs' information center is a service to end users who need a decision support activity. "We also work with people who might not have had contact with MIS [management information systems] in the past."

According to DeLong, "We organized our [information center] a year ago and now support 400 to 500 users, including 250 time-sharing users, 150 in office systems and 50 to 100 on micros. This work includes all graphics for the company, all office systems and personal computers."

The impetus to develop an information center in DeFazio's organization was intolerable application backlogs, some as long as two to three years, he said. In addition, users were buying minis to try to help dig themselves out of the backlogs.

"With such unstructured activity, the corporation felt computing was likely to become out of control so it was recommended that we establish two information centers, one at corporate headquarters and one in the research center," DeFazio said.

"Our biggest job was con-

(Continued on Page 34)

How Does Info Center Fit In Firm's Reporting Structure?

Where does the information center fit within a firm's basic reporting structure? Some DP managers replied.

At Union Carbide Corp., both information centers report to the manager of scientific applications development, Bob Hutton said.

At Michigan Wisconsin Pipe Line Co., the information center staff reports directly to an assistant vice-president, according to Jim DeLong. "Normally there is a director between a manager and a vice-president so it was a very positive point for the [information center] to report directly to a vice-president," he said.

"At Gulf, the [information center] is split between the central staff and respective user areas," Sam DeFazio noted. "Through a steering committee, the beneficiaries of the technology really 'own' the information center while Systems Development provides day-to-day operations, he said.

Candle Offers IBM Support

LOS ANGELES — Candle Corp. has announced IBM Fast Path support for its Omegamon and Dexan IMS performance monitors for IBM's IMS data base management system.

The modification features new exception reporting capabilities and additional commands. Exception reporting displays messages for Fast Path buffer serialization, buffer contention, region in wait for buffer and wait for output thread.

Operating requirements for IMS Level 1.1.5 or above run on IBM and plug-compatible mainframes running MVS.

The existing Dexan/IMS analysis will be extended to include Fast Path transactions and Fast Path specific degradation analysis, the vendor added.

Each package costs $19,500 from Candle Corp. at Suite 2404, 10880 Wilshire Blvd., Los Angeles, Calif. 90024.

Integrated With Total

Cincom Query Aid Bows

CINCINNATI — Cincom Systems, Inc. has announced a query facility for its Total data base management system for Digital Equipment Corp. PDP-11 minicomputers running under RXS-11M.

Minicomputer Query is integrated with Total to navigate and extract data from different data sets without selectively viewing one file at a time, a spokesman said. The facility's extraction and reporting language allows output selection criteria to be based on factors ranging from simple comparisons to full boolean extraction logic. Output displays are available to a terminal.

Standard arithmetic operations reportedly include subtotals, subaverages, minimums, maximums, summary totals and averages of numeric data or derived fields. Multiple languages can be loaded and each user assigned an identification for a specific language.

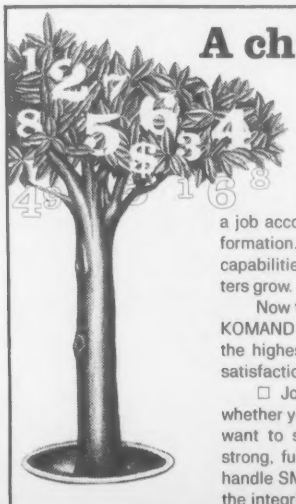
The package costs $8,000 for PDP-11/23 and -11/24 users, $12,500 for PDP-11/34 to -11/60 users and $15,000 for PDP-11/70 users from Cincom at 2300 Montana Ave., Cincinnati, Ohio 45211.

Thorne Unveils Updated Recflow

ATLANTA — Thorne Data, Inc. has announced Release 3.0 of Recflow, a documentation aid for IBM users.

Recflow is said to print record layouts the way programmers draw them. It picks out records from Cobol programs and requires no changes or additions. The facility handles any type of Cobol record and includes improved handling of Occurs elements, the company claimed. Users may optionally select the print characters for both horizontal and vertical lines that separate fields.

The license fee is $3,000 from Thorne Data at 9320 Huntcliff Trace, Atlanta, Ga. 30338.



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DP Managers Laud Their Information Centers

(Continued from Page 31)

vincing corporate executives; we didn't have to market to the users at all," he continued. "If anything, our biggest problem was holding users back in order to keep from swamping our initial [information center] resources. We have 1800 potential end users, half of whom currently have access to the computer."

"The impetus for our [information center] came from the MIS group," Sterling's Martin noted. "We have a critical backlog and although management questioned whether users did want to do things themselves through an [information center], a one-year pilot study found that users needed help and were willing to learn to use [information center] tools themselves. Today Sterling is still a bit conservative in pushing the [information center] because we want to make very certain that we stay serviceable."

Mathur added that the impetus for his organization came from IBM. "At Blue Cross of Northern Ohio the Information Systems Group pushed hard for an information center and there was not much resistance from users." Asked how it is decided what work goes to the information center, Mathur replied, "Our [information center] is called Business Systems. Its role is to be the technology consultant to users. If a project is a large undertaking, it goes to traditional systems development."

"If an application is large enough and will be used by multiple areas, we may prototype it or just refer it to the corporate information systems development staff directly," DeFazio added."

Martin said, "We look for an aspect of do-it-yourself desire on the user's part. Since we do an in-depth needs analysis with each end user before a project is accepted by the [information center], we sometimes send users back one or even several times to rethink what they expect."

In terms of staff, DeLong's information center has 20 persons, three-fourths of whom are specialists in one or two products. "We currently have a 25:1 ratio of users to staff and a 2:1 ratio of products over staff," he said. Hutton added that his group has about 500 users per information center staffer.

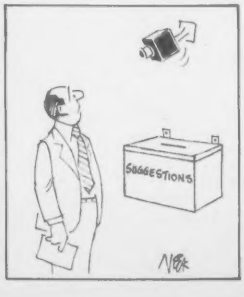
Cost Savings Defined

Asked if the success of the information center in terms of cost savings can be pinpointed, Hutton said, "We have experienced a great deal of growth in the past year. In that time the number of CMS users we service has doubled and we typically have over 200 simultaneously active users each day. We don't see an end to this growth. Our backlog is not particularly high because, although the [information center] is very busy, we are staying ahead of the game."

According to Martin, "The biggest savings we have been able to identify from the [information center] is cost avoidance or the ability to use a tool already in place instead of buying a new tool. Users are getting three things: the right information at the right time in the right format."

DeFazio added, "The rate of growth in our [information center] has been so large that we at some point will be out of capacity. In the past seven months we have gone from 10 concurrent [information center] users to 130 users."

"We knew our [information center] was a success when the president asked for a terminal and a prompted Executive Information System. Thanks to the [information center], we expect that a full integration of DP into the corporate structure is at hand," Mathur said.



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Responses, Techniques Vary

Managers Explain Role of Micros in Info Center

What role, if any, personal computers play in the information center was one question that was posed to four DP managers who have successfully implemented the concept.

Jim DeLong of Michigan Wisconsin Pipe Line Co. explained, "Our [information center] coordinates the acquisition of all [personal computers] by policy. Senior management doesn't particularly support micros because of the problems of data synchronization and integrity."

"At Gulf, we see the micro problem as twofold. First is the extraction of data from the central data bases and manipulation on a [personal computer]. The second problem is the flow of information from [personal computers] back into the mainframe system," Sam DeFazio of Gulf Research & Development Corp. explained.

"A local-area network may be the solution for us. With existing technology, someone can go to the central data base, pull off some information in a report, simply retype the report and make the numbers say anything. The issue of synchronization is a management issue."

Valerie Martin's group at Sterling Drug, Inc. conducted a survey and then drafted a policy statement regarding personal computer acquisition and usage. "Now we are reviewing educational needs of our [personal computer] users," she said.

"We handle the [personal computer] issue a bit differently at Union Carbide by maintaining a small organization, not a part of the [information center], to handle the [personal computer] user requests," Bob Hutton added.

Who Pays for Resources Of Information Center?

Who pays for the information center resources — data processing itself or the end-user departments that take advantage of the tools offered?

"Our [information center] is treated as a cost center or corporate overhead," Valerie Martin, DP manager of Sterling Drug, Inc., explained. "But we keep track of resource usage for each end-user project so we can show management where we're spending our time."

"We got our [information center] going by billing each division a portion of the [information center] costs and then sending bills listing individual usage of the computers," Sam DeFazio, DP manager of Gulf Research & Development Corp., offered. "However, in the last couple of months, everything basically has been charged back to the users for a total cost recovery. Users can also type 'Money' to see what a particular function has cost."

"Cost information is extremely important and our [information center] tracks everything, by man hours and computer cycles, for user charge backs," Union Carbide Corp. DP manager Bob Hutton asserted.

Michigan Wisconsin Pipe Line Co.'s organization charges computer costs to timesharing users only, according to DP manager Jim DeLong. "We are starting to bill all subsidiaries directly and soon we will start to bill for all manuals and training which means we will do more than just recover computer costs," he said.

"Right now at Blue Cross, we feel it may be too early to charge users. Perhaps in three to four years we will be ready to take that step," DP manager Vijay Mathur noted.

FCS Announces Fixed-Price T/S For DP Service

WALTHAM, Mass. — Finreport Computer Services, Inc. (FCS) has announced the availability of fixed-price time-sharing for its IBM VM/CMS- and DOS/VSE-based computer service.

Called Optimum, the service reportedly provides each user with unmeasured use of the processor; all basic facilities of VM/CMS, DOS/VSE; other program products such as CICS/VS, Interactive System Productivity Facility, Remote Spooling Communications Subsystem networking; and a number of languages, including an enhanced IBM VS APL. Other items included in Optimum are provisions for storage and communication access to the host, RJE support and local and remote printing.

The average monthly use charge for Optimum is $1,500 per user, for a minimum term of 12 months. FCS, Inc. is located at One Moody St., Waltham, Mass. 02154.

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For Informatics' Smart/Dasd

Dasd Enhancements Announced

CANOGA PARK, Calif. — Informatics General Corp. has announced enhancements for its Smart/Dasd performance optimization package for direct-access storage devices (Dasd).

The package supports IBM and plug-compatible systems running OS and can be used with CICS, IMS and TSO, the spokesman said.

The enhanced version includes IBM 3380 migration and modeling capabilities to enable IBM or plug-compatible Dasd users to configure higher density devices, construct strings of least contending volumes and simulate performance based upon existing work loads, a spokesman said.

The package can be used with double-density drives, including Storage Technology Corp.'s 8650, Control Data Corp.'s 33502 and Memorex, Inc.'s 3652, the vendor said.

The cost is $10,000 from 21050 Vanowen St., Canoga Park, Calif. 91304.

PRO/grammar Offered On BCS Network

VIENNA, Va. — Boeing Computer Services Co. (BCS) has announced the availability of Pansophic Systems, Inc.'s PRO/grammar, a high-level language and report generator, on its telecommunications network.

PRO/grammar's features include the ability to compile and create object code directly from programmer-written statements. Users can also run PRO/grammar in a load-and-go mode for ad hoc requests and testing. The package logically groups a number of job activities into a single execution, a spokeswoman said. Program elements or entire programs can be stored in a macro file that lets users copy common code into applications and allows unlimited positional and keyword parameter substitutions.

PRO/grammar is available from BCS via its Mainstream remote computer services. Line speeds range between 300 and 4,800 bit/sec and dedicated access is available at 4,800 bit/sec. Prices vary widely based on processing, connect and storage costs, the spokeswoman said from 7980 Gallows Court, Vienna, Va. 22180.

Researchers Get BBN Tool

CAMBRIDGE, Mass. — A software system usable by nontechnical researchers that reportedly integrates data management, statistical analysis and graphics capabilities has been announced by Bolt Beranek & Newman, Inc. (BBN).

The RS/1 software is an electronic lab notebook for research and development, quality control and laboratory applications. Interfacing with other statistical packages, RS/1 runs on Digital Equipment Corp. VAX-11 and PDP-11 computers.

The software costs between $12,000 and $28,000, depending on options and computer size. BBN is located at 10 Moulton St., Cambridge, Mass. 02238.

TWG Eunice Release Enables VAX/VMS to Run Unix

PALO ALTO, Calif. — The Wollongong Group (TWG) has announced Eunice Release 3.1, an operating system which is designed to enable Digital Equipment Corp. VAX/VMS systems to run Bell Laboratories' Unix operating system.

Eunice 3.1 provides the Source Code Control System facility for control and access protection for program and documentation control, the vendor said.

Used in conjunction with VMS, Eunice enables VAX users to operate in a Unix environment using any Unix or VMS utilities or in a VMS environment with the ability to use all Unix tools with the VMS utilities. When using Unix compilers, users have a choice of generating either Unix or VMS object files, according to the vendor.

New features include support of all standard Unix file names, learn and games utilities and long file names up to 256 characters, a spokesman said.

A full screen editor, Ryan-McFarland Corp. RM/Cobol and TWG's Tabstar data base management system are available as options. Eunice is priced at $5,250 with availability in March from 1135A San Antonio Road, Palo Alto, Calif. 94303.

Performance Monitor Out For VAX-11s Running VMS

BOULDER, Colo. — Di Sys, Ltd. has introduced a system performance monitor for use with Digital Equipment Corp. VAX-11 minicomputers running VMS.

The System Performance Monitor is said to augment existing utilities and offer detailed, process-specific information. It is designed to aid in capacity planning and to give insight into system activities, a vendor spokesman claimed.

The monitor runs on all VMS VAX machines and supports Versions 2.0 and 3.0, according to the vendor spokesman.

It is available for $2,500, which includes three months of updates. More information is available from Di Sys, Ltd. 5375 Western Ave., Boulder, Colo. 80301.

Delta 4.7 Replaces Apex/SL Service

OVERLAND PARK, Kan. — United Information Services, Inc. (UIS) has replaced its Apex/SL Service permanent storage system with a new system.

The Apex/SL Service offers Control Data Corp. Cyber-based remote computing services. The new permanent storage system, the Delta 4.7, is said to be upwardly compatible and to allow such capabilities as 40-char. permanent storage names, cycled permanent storage families, tree-structured catalogue management and shared write access.

The Apex/SL is available on a time-sharing basis. UIS is located at 5454 W. 110th St., Overland Park, Kan. 66211.

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Among the three most widely used systems—MANTIS, DMS and UFO—MANTIS *led every user satisfaction category:* productivity enhancement, on-line performance, ease of learning, ease of use, documentation, support and reliability. And in the most important category—"Overall Capabilities"—MANTIS was again the winner.

User satisfaction? 33% of DMS users said they would *not* recommend their system to others. Among UFO users, 6% would *not* recommend theirs. For MANTIS users, not one single user said no.

Further evidence of MANTIS' superiority is the overwhelming industry acceptance. In only 18 months since its introduction, MANTIS has gained 11% of the total ADS market share. That's a substantially higher growth rate than all of the other seven systems studied.

But while we're very pleased to be the runaway winner, we're even more pleased that MANTIS is becoming the industry standard for on-line programming. 84% of MANTIS users develop 91-100% of their applications with the system. Only 67% of DMS users reported such high usage. With UFO, the figure plummeted to only 48%.

These are merely the highlights of the conclusive Merlyn Study. But the findings are clear. When it comes to application development systems, MANTIS is in a class by itself.

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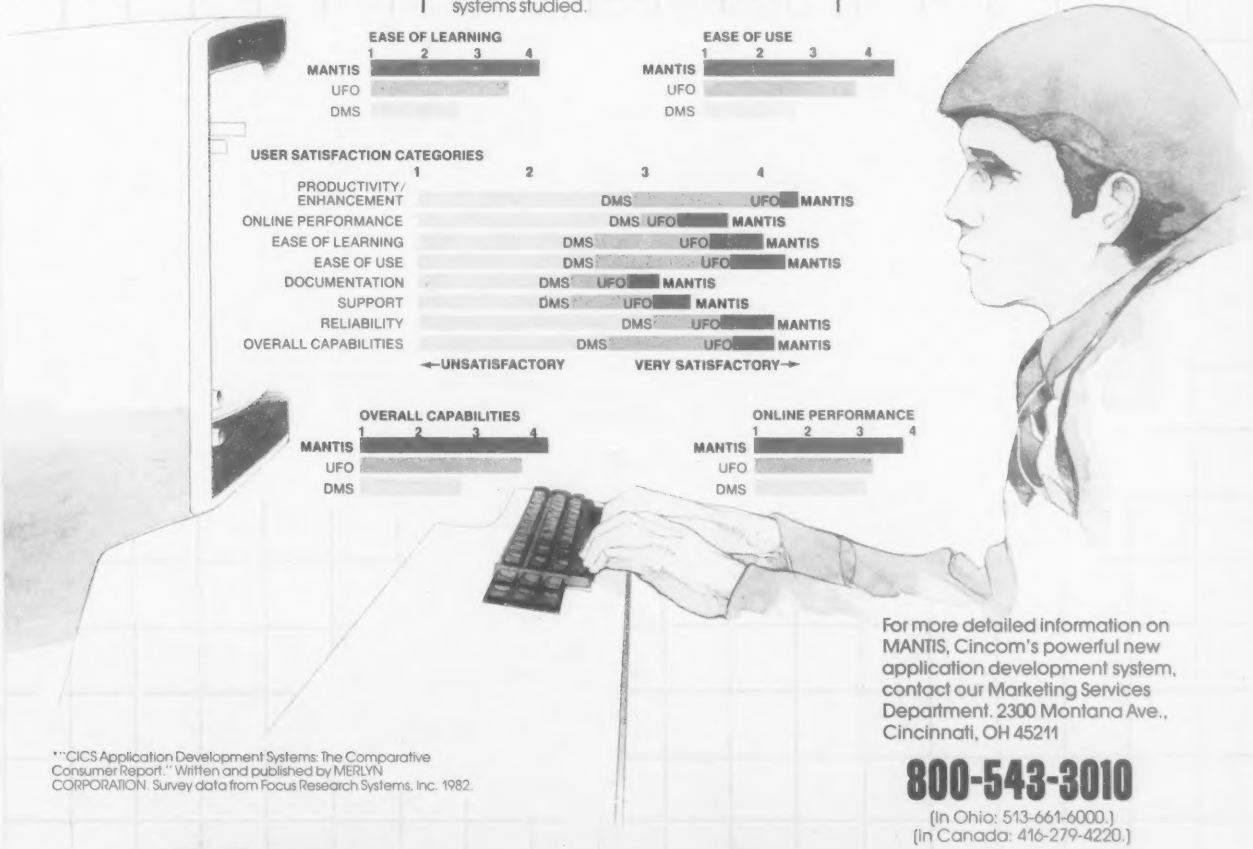

*"CICS Application Development Systems: The Comparative Consumer Report." Written and published by MERLYN CORPORATION. Survey data from Focus Research Systems, Inc. 1982.

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SAS/FSP Enhancement Provides Financial Help

CARY, N.C. — The recent SAS user group meeting was the launching point for an enhancement to SAS/Full Screen Product (FSP) called Fscalc.

The facility is said to provide SAS users with an interactive electronic spreadsheet for financial modeling and analysis. SAS Institute also noted that the SAS Color Graphics 100-Series Video Training Course has been added to the SAS Video Training Library.

The Fscalc procedure runs in a 32-bit environment to allow users to share their data on corporate hardware, according to SAS Institute.

Fscalc runs in Definition mode, in which users add, delete and move rows and columns and develop models; and in Run mode, in which users change their data and conduct "what if" analyses, the vendor explained.

The procedure has three screens. The spreadsheet screen reportedly allows users to define and display an infinite number of rows and columns. The program editor screen provides a full screen editor and supports line commands such as Find and Change. The message screen allows SAS to display messages regarding observations per track, error messages and completion codes.

Fscalc's features include unlimited spreadsheet size; a modeling language said to support most features of the SAS Data step, including arrays and macros; an on-line, menu-driven Help facility; a split-screen capability; and the facility to consolidate the current screen with a previously saved screen. The package also includes row and column operations; the use of color to highlight protected and unprotected fields; optional protection of every cell in the screen and automatic protection of function cells; and the ability to suppress row names when the spreadsheet is printed.

The Fscalc procedure will be available for beta testing in April, with the production release scheduled for mid-1983, the vendor noted. The procedure will be distributed automatically, at no extra charge, to SAS/FSP customers. SAS/FSP is available to corporate SAS customers in the U.S. for a first-year lease of $3,600. Each additional year is $1,800.

A preview package of the SAS Color Graphics Video Training course will be available in February, with distribution of the completed course scheduled for March 1983. The course contains eight modules which describe the basics of SAS/Graph.

SAS video products are licensed on a quarterly basis. The first-quarter rate for corporate customers is $2,000. Each additional year is $750.

SAS Institute is located at SAS Circle, P.O. Box 8000, Cary, N.C. 27511

Interpreter Out For Unix System

CAMBRIDGE, Mass. — Softshell, a full-screen command interpreter for Bell Laboratories' Unix operating system, has been introduced by Logical Software, Inc.

The interpreter runs on Digital Equipment Corp. LSI-11/23, PDP-11/24 and PDP-11/34 systems, as well as on the IBM Personal Computer.

It is intended to enable unsophisticated users to handle Unix's hierarchical file and command structure, while still providing the full power of the operating system for experienced users.

Software gives users the choice of entering commands directly in scroll mode or using the package's full-screen mode, which provides a list of Unix commands and options, the vendor said.

Softshell also was designed to allow users to distinguish directories from subdirectories through the use of rectangular windows calls panels, which graphically display Unix's hierarchical file structures.

Once a file or subdirectory is located, Softshell provides a focus facility that allows users to call up the contents of the file for a closer look, the vendor explained. This capability permits users to display and utilize lists of commands, directories and help and user files.

The package reportedly includes a C-language interface to the paneling routine designed to allow users to write programs to display and edit information in previously designed hierarchical structures.

The vendor noted that Softshell can be combined with its Logix relational data base management system.

A source license for Softshell can be purchased for $10,000. Sublicense fees for binary copies generated from the source range from $10 to $100 per copy, depending on volume. Logix users who purchase the Softshell software receive menu definitions for the Logix programs, the vendor reported.

Software will be available for delivery in February, the vendor said from 55 Wheeler St., Cambridge, Mass. 02138.

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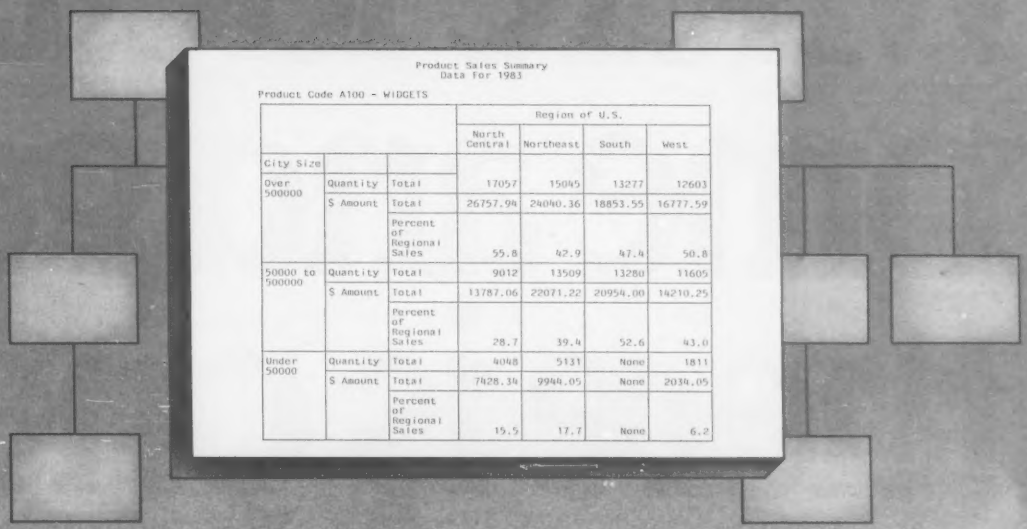

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Data for 1983

Product Code A100 - WIDGETS

			Region of U.S.			
			North Central	Northeast	South	West
City Size						
Over 500000	Quantity	Total	17057	15045	13277	12603
	$ Amount	Total	26757.94	24040.36	18853.55	16777.59
		Percent of Regional Sales	55.8	42.9	47.4	50.8
50000 to 500000	Quantity	Total	9012	13509	13280	11605
	$ Amount	Total	13787.06	22071.22	20954.00	14210.25
		Percent of Regional Sales	28.7	39.4	52.6	43.0
Under 50000	Quantity	Total	4048	5131	None	1811
	$ Amount	Total	7428.34	9944.05	None	2034.05
		Percent of Regional Sales	15.5	17.7	None	6.2

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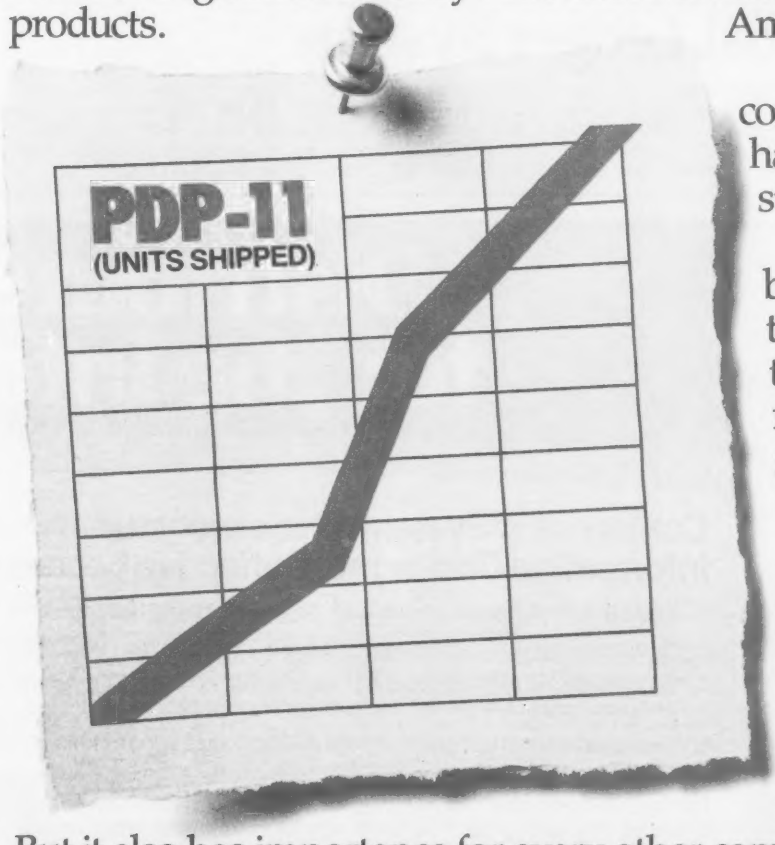

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For OS/VS1, MVS Systems

'OMS/Monitor' Provides On-Demand Info

JERICHO, N.Y. — Computer Associates has integrated an on-line task manager with its CA-TLMS II tape library management system and CA-Manage/Dasd direct-access storage device data set management products for IBM OS/VS1 and MVS systems.

OMS/Monitor provides communications between the products and makes abend and status information available on demand, a spokesman said. When used in conjunction with CA-TLMS II Release 4.0 and CA-Manage/Dasd Release 2.2, it is possible to achieve dynamic restoration of data sets, eliminating program abends due to lost or archived data sets, according to a vendor spokesman.

OMS/Monitor reportedly allows both products to share one address space, the spokesman added, and it automatically determines which data set management product is being addressed.

CA-Manage/Dasd has also been enhanced to include volume compression and an idle space release feature that increases the usable Dasd disk space. The new relase also supports VS1, Indexed Volume Table of Contents and 3375 and 3380 disk drives.

CA-TLMS II is priced at $15,000 for a three-year lease. CA-Manage/Dasd costs $7,000 for a three-year lease. The combined packages cost $20,000. OMS/Monitor is available at no charge with other OMS series products from 125 Jericho Turnpike, Jericho, N.Y. 11753.

Tools Out for Global Ledger System

RALEIGH, N.C. — Global Software, Inc. has announced new on-line tools for its Global General Ledger System for CICS-based IBM mainframes running Cobol programs.

The company also announced the General Ledger and Financial Reporting Package for users of IBM System/38.

On-line data entry and inquiry has been added to Global General Ledger, the company said. Other enhancements include Quick Close, which allows adjustments and updates of accounting reports on a real-time basis. Profit Planning and Budgeting allows what-if planning and forecasting with time series and bivariate regression analysis available interactively, according to a vendor spokesman.

The Real-Time Reporter offers specification and execution of reports on-line, a spokesman said. Features include propagation of existing reports with minor changes and scan review, the spokesman said.

A graphics enhancement provides an interface with the IBM Graphical Data Display Manager and offers line graphs, scatter plot graphs and bar charts. Price ranges from $45,000 to $90,000.

The System/38 General Ledger and Financial Reporting package is a real-time system that includes use of data base structure and RPG-III, externally defined files, no sorting, practical user of logical views and a procedure monitor to improve system integrity, the spokesman said.

The product costs from $35,000 to $43,000. Both packages are available from Global Software at 1009 Spring Forest Road, Raleigh, N.C. 27609.

MCBA Offers 'SPC' in Dibol For PDP-11s

MONTROSE, Calif. — Mini-Computer Business Applications, Inc. (MCBA) has announced Standard Product Costing (SPC) written in Dibol for Digital Equipment Corp. PDP-11s.

As the latest addition to the MCBA manufacturing system, SPC is an interactive tool said to maintain standard or estimated costs for both manufacturing and accounting management.

SPC reportedly maintains up-to-date costs for all products, parts and services provided by a company. SPC requires MCBA's Inventory Management (I/M) and Bill of Material Processor (Bomp) packages.

A source code license for MCBA's RT-11 SPC is $3,000 for one computer and $4,000 for a 10-computer license. The RT-11 I/M and Bomp are $4,000 for one use and $5,250 for a 10-use license, according to a vendor spokesman. MCBA is headquartered at 2441 Honolulu Ave., Montrose, Calif. 91020.

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* "Competitive Product Analysis of Decision Support Systems" Research & Planning Inc., Cambridge, Mass.

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Warehouse Management Tools Run on VAX

LEXINGTON, Mass. — Distribution Management Systems, Inc. (DMS) has announced two software packages for distribution and warehouse management of finished goods inventories. The DMS-1000 Distribution System and DMS-1500 Warehouse Management System run on Digital Equipment Corp.'s VAX series of computers.

The packages are said to include the capability to support remote and hand-held terminals, bar code readers and labelers. In addition, they can provide control of multiple distribution centers on a centralized or distributed basis.

DMS-1000 handles order processing, inventory management and billing, the vendor said. It also generates the information required for accounts receivable systems. Optional modules include accounts receivable, physical inventory support, requirements planning, finished goods inventory replenishment, general ledger, purchasing, accounts payable and budgeting.

The DMS-1500 handles order entry, receiving, inventory location and management, picking, packing and shipping. It can be interfaced to centralized order processing and billing systems and to automated materials handling systems and can serve as an adjunct to the DMS-1000. The package includes first-in, first-out accounting support, serial and lot number controls and picking and shipping features. An optional module provides the ability to track and analyze warehouse performance.

The DMS-1000 starts at $130,000 and DMS-1500 starts at $75,000, the vendor said from 81 Hartwell Ave., Lexington, Mass. 02173.

Claims Processing System Designed for Decsystem-20

SPARTA, N.J. — Insurance Network Systems, Inc. has developed a Universal Policy Issuance and Claims Processing System that was designed to run on the Digital Equipment Corp. Decsystem-20 series of computers.

Aimed at property and casualty insurance carriers, managing general agencies and self-insureds, the on-line system was designed to handle a series of services including: business owners, workers compensation and commercial auto coverages on a national basis, Insurance Network Systems said.

The system is said to maintain a policy data base, print policies and process endorsements, cancellations, reinstatements and rewrites.

For purchase, the system costs between $20,000 and $80,000, depending on functions, according to the vendor.

On a time-sharing basis, customization costs between $20,000 and $80,000 with monthly charges on an as-used basis.

Insurance Network Systems is headquartered at 3 Theater Center, Sparta, N.J. 07871.

Cobol Tool Out For Burroughs

MINNEAPOLIS — Technalysis Corp. has announced the Compiler Optimizer Package (COP) for Cobol programmers working on Burroughs Corp. B-1700, B-1800 and B-1900 computers.

The COP interrogates the operating system whenever a Cobol compile is executed to determine available resources and current disk and memory utilization, according to Technalysis.

It then dynamically optimizes the Cobol compiler, the company claimed.

A compile mix limit can be set and a queuing technique automatically regulates the mix limit and priorities of compiles in the mix or waiting to be executed.

The product also prevents contention between compiles and on-line programs.

A one-time charge for the program is $2,000 from Technalysis. The firm is located at 6700 France Ave. S., Minneapolis, Minn. 55435.

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Computer Security Package Announced for VAX-11/780

ATHENS, Ga. — A computer security package for the Digital Equipment Corp. VAX-11/780 has been announced by Cosmic, Inc., the dissemination center for software developed by the National Aeronautics and Space Administration.

The package includes four components. Autobaud adjusts the baud rates and allocates remote terminal lines. If a remote terminal is not logged in, Autobaud performs periodic hangup. Monitor examines all terminals every 15 minutes and logs off users who fail to perform any CPU activity after a specified period.

Guardian records data on every unsuccessful log-in. On multiple unsuccessful attempts, Guardian performs hangups and logouts and signals an alert. Inspect allows examination of suspicious processes.

The source code for the four programs costs $580 from 112 Barrow Hall, University of Georgia, Athens, Ga. 30602.

DBMS Offered for PDP-11

ARLINGTON HEIGHTS, Ill. — International Software Enterprises (ISE) has released a post-relational data base management system for Digital Equipment Corp. PDP-11 series computers running under RSX-11M and most popular microprocessors.

Micro Data Base Systems (MDBS) III reportedly supports semantically oriented data structures and can also be used to define older architectures. Facilities include data compression and encryption, nine types of data fields, automatic security checking and feasibility range checking for any field's values.

Three languages are available for interfacing with an MDBS III data base. The Data Manipulation Language (DML) has commands for both record-at-a-time processing and for generating entire collections of records satisfying desired criteria. DML commands can be invoked from within applications written in C, Fortran, Basic +2 or Macro 11.

Pricing depends on options, with the RSX-11M version of MDBS III ranging from $7,000 to $14,000. The Digital Research, Inc. CP/M version starts at $2,400, the MP/M-86 version ranges from $4,200 to $5,500 and the Altos Computer Systems, Inc. 8600 version ranges from $5,000 to $6,675. The company is located at 85 W. Algonquin Road, Arlington Heights, Ill. 60005.

System/34 Gets On-Line Mail Aid

CARSON CITY, Nev. — An on-line mailing package for the IBM System/34 has been developed by Systems Design Consultants.

Dynamic Mailer maintains basic name and address information, phone numbers and category fields. On-line functions include edit and update, inquiry, alpha search, user-defined edits and report selection.

The software costs $199 including source code and documentation from the firm at 625 Fairview, No. 117, Carson City, Nev. 89701.

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Security Tools Fit HP Micros

MOUNT HOLLY, N.J. — Structured Software Systems, Inc. has announced two software security packages for use with Hewlett-Packard Co. desktop computers.

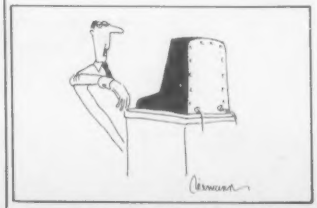
SEC36 runs on HP 9836 and 9826 computers. It protects Basic programs that are distributed on HP standard minifloppy disks by "fingerprinting" the disks with special security codes, a spokesman said. The codes are checked by an assembly language subroutine that is appended to each application program that is to be protected. Protected program copies to a nonfingerprinted disk cannot be successfully loaded.

During encipherment, SEC36 removes comments and deletes the names of all program symbols, reducing memory requirements, the spokesman added. The package costs $4,000.

Dsec87 runs on the HP 86 and HP 87 computers with standard 5¼-in. flexible disks. The package prevents listing the protected program and prevents copies from running unless the original disk is physically mounted in the drive.

The two-part system consists of treated disks containing an embedded identification key that is unique for each Dsec87 owner and user. The package prevents listing, tracing, merging and any other revealing access to secured programs by any system routines, the spokesman said. The package costs $1,500.

Both are available through Box 1072, Irick Road, Mount Holly, N.J. 08060.



'You're the Big Decision Maker, Where Do I Eat Lunch?'

'Aegis' Limits CPU Access

NEW YORK — A software package that limits on-line access to computers to maintain the security of data has been announced here by Cornell Computer Corp.

Aegis allows on-line access to authorized personnel who are using authorized terminals at authorized hours of the day on authorized days of the week, the vendor said, referring to the products' four levels of security.

This product operates on IBM mainframes and plug-compatibles. It costs $17,500, from the vendor at 363 Seventh Ave., New York, N.Y. 10001.

Aid Targets VAX/VMS

ATLANTA — Raxco, Inc. has announced the availability of its Rabbit-2 Performance Analysis for Digital Equipment Corp. VAX/VMS Release 3.0 and above.

Rabbit-2 is an interactive performance analysis system developed for PDP systems running under RSTS/E and RSX11M+. The software is said to generate graphics displays of computer resource demands through an interactive English-like command language.

New features include image or program analysis, specification of time intervals and time periods and automatic display of the program resource demands placed on the system.

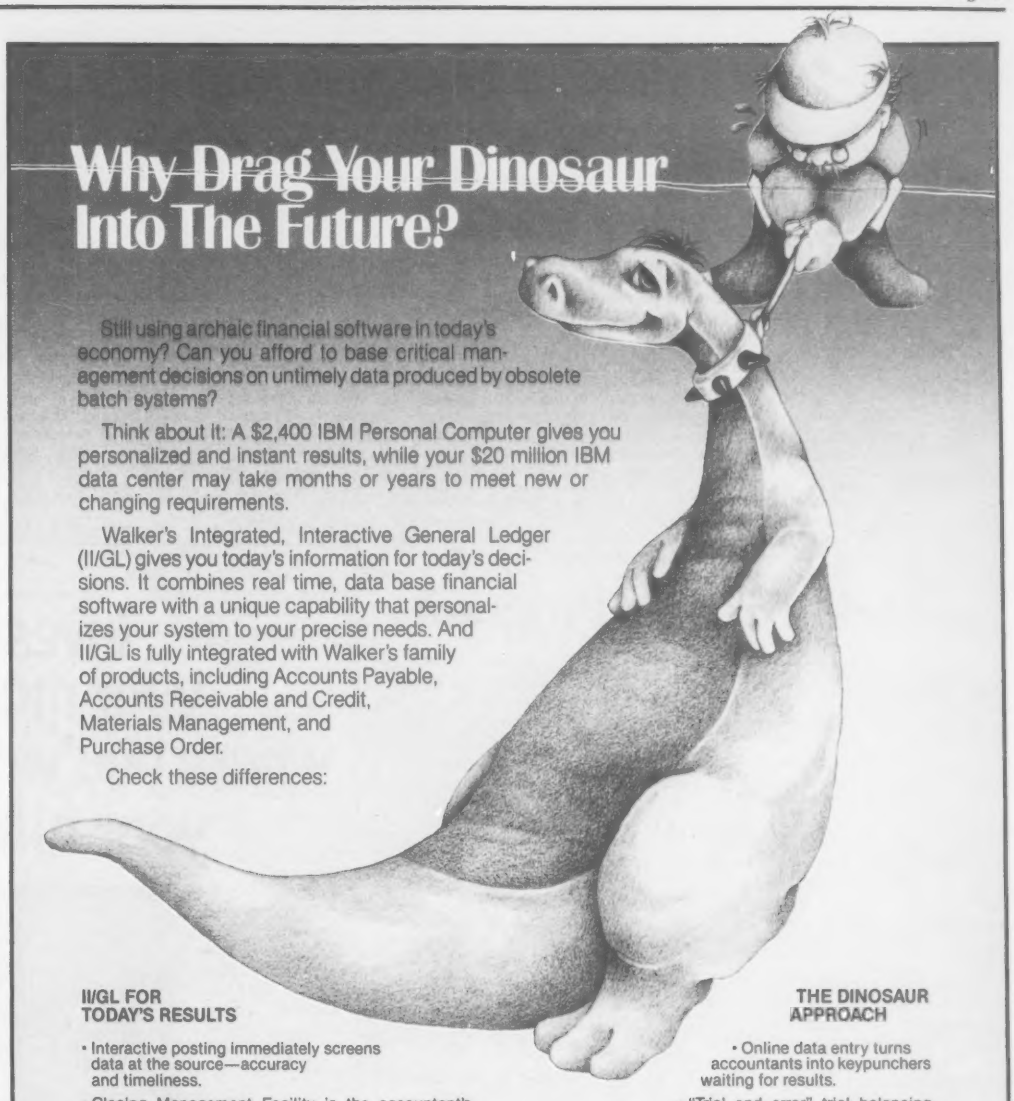
VAX Rabbit-2 may be purchased for $3,995 or rented for $200/mo from the firm at Suite 200, 6520 Powers Ferry Road, Atlanta, Ga. 30339.

'Security-II' Fits Gcos

MECHANICSBURG, Pa. — Caci, Inc.-Federal has announced an on-line security package for users of Honeywell, Inc.'s Data Management IV Transaction Processing data base management system. Security-II runs on Honeywell Level 66 and DPS 8 systems under Gcos operating system software

Identification codes and passwords are used, and permissions can be restricted to query or update for a given user/transaction as defined by the security administrator, the company claimed.

The package costs $7,300 from Caci's Advanced Systems Department, 5010 Trindle Road, Mechanicsburg, Pa. 17055.



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Micro Notes

Radio Shack has announced an enhanced version of Visicorp's Visicalc spreadsheet planning package for its TRS-80 Model II microcomputer. **Visicalc Enhanced** generates larger spreadsheets by utilizing any additional memory, a spokesman said. New features include an entry editor, logical and comparison operators and built-in math functions. The program can also produce and store simple graphs. A 64K-byte memory expansion board, priced at $399, improves package performance, the spokesman said. Visicalc Enhanced costs $299 from 1800 Tandy Center, Fort Worth, Texas 76102.

Selva Systems, Inc. has released **Graphics Language for Microcomputers (GL/M)**, a Digital Research, Inc. CP/M-based package which the company claimed turns popular word processing printers into intelligent graphics output devices. The initial version supports Xerox Corp. 620, 630 and 1600 series, NEC Spinwriter 7715 and 7725 and Epson America, Inc. MX-80 and MX-100 printers.

The package produces bar, line, pie and flow charts, histograms, figures and illustrations, a spokesman said. Single commands can change size and aspect ratio and thumbnail graphs can be integrated with text.

The package requires 64K bytes of memory, CP/M, two disk drives and a printer and costs $295 from Selva at 167 Worcester St., Wellesley, Mass. 02181.

EEC Systems, Inc. has announced the availability of the **LEX-11** word and data processing package on the Digital Equipment Corp. Professional microcomputer under the P/OS operating system. The package includes full screen editor, list processing, data base management, business graphics and a visual calculator and costs $850. An introductory on-line training guide costs an additional $200 and a spelling checker is also priced at $200. The company is located at 327/E Boston Post Road, Sudbury, Mass. 01776.

Businessoft International Corp. has introduced a three-dimensional spreadsheet package for microcomputers running Digital Research, Inc.'s CP/M 80 or CP/M 86 operating system. Called **Wondercalc**, the package reportedly features three-dimensional business algebra, separate Manager's and Data Entry modules and a variety of formatting options for business reports and graphs.

Wondercalc processes spreadsheets of up to 998 rows and 99 columns depending on available memory, a spokesman said.

The three-dimensional business algebra feature performs three-dimensional consolidation or arithmetic operations on forms, the company claimed, creating total, average, standard deviation and count of data entered cells.

The package requires a 24 by 80 display, 64K bytes of memory, two disk drives and a printer. The Manager's Module costs $395 and the Data Entry Module costs $195, the vendor said from 24 Jean Lane, Monsey, N.Y. 10952.

Decision Resources has announced an expanded version of its **Chart-Master** business graphics package for the IBM Personal Computer using Hewlett-Packard Co. plotters. This version offers on-screen previewing of charts, multiple character fonts and new chart types. The enhanced product costs $375. The vendor can be reached through P.O. Box 309, Westport, Conn. 06881.

A language system called **Hemenway/Forth**, which reportedly enhances the software development capabilities of the Motorola, Inc. MSP/68000 real-time, multitasking operating system, has been announced by Hemenway Corp. Prices start at $115, the vendor said from 101 Tremont St., Boston, Mass. 02108.

Ramtek Expands Program

SANTA CLARA, Calif. — Ramtek Corp. has added 10 vendors to its Software Affiliation Program. Members of the program provide computer-aided design and manufacturing software that runs on Ramtek's RM-9460 and Marquis graphics and image display systems.

Marquis and the RM-9460 are Zilog, Inc. Z80- or Motorola, Inc. 68000-based display generators with resolutions of 1,280 by 1,024 pixels and have the ability to display 256 simultaneous colors. Both systems run on Digital Equipment Corp. VAX computers.

The new members and their offerings are: MacNeal Schwendler Corp. (MSC/Grasp, finite element pre-/post processor); Swanson Analysis, Inc. (Ansys, finite element pre-/post processor); Georgia Tech (GTStrudl, finite element pre-/post processor); University of Southern California (Post, finite element pre-/post processor and kinetic analysis for Cosmo); General Electric-CAE (Structural Dynamics Research Corp.) (Supertab, finite element pre-/post-processor and kinetic analysis); Manufacturing and Consulting Services, Inc. (Anvil-4000, mechanical design, drafting and manufacturing); Design Information Systems, Inc. (DIS/Adlpipe, pipe stress analysis); Structural Programming, Inc. (Mapps, project management; Palette, two-dimensional drafting and three-dimensional modeling); University of California-Berkeley (Spice, circuit simultation; KIC, input for Spice); and Silvar Lisco (Gards/SDS, gate array design; CAL-MP, MOS circuit design).

Ramtek is located at 2211 Lawson Lane, Santa Clara, Calif. 95050.

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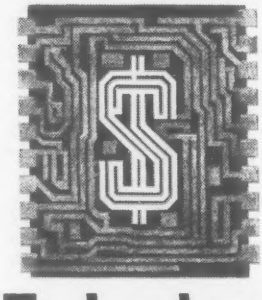

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Emulator Links IBM 3101 Terminals To Host Using 3270

MIAMI — Innovative Electronics, Inc. has announced the MC-80/600-03, a device that reportedly emulates IBM 3277 and 3278 display terminals using an IBM 3101 terminal.

The emulator allows 3101 terminals to communicate with an IBM host processor using 3270 binary synchronous communications (BSC) protocols. The unit emulates an IBM 3270 BSC controller with one or two ports available for any combination of display stations or printers. In addition, the unit can be used in place of several IBM control units, including the 3271 Models 1 and 2, the 3276 Models 1 and 2 and the 3274 Model 51C, the vendor said.

The MC-80/600-03 comes with 16K bytes of read-only memory and 16K bytes of random-access memory. A single-port unit costs $1,495. A two-port version costs $1,695. A modem-sharing option costs $300, the vendor said from 4714 N.W. 165th St., Miami, Fla. 33014.

Emulating Controllers Link Firm, 'Far-Flung' Workers

SUNNYVALE, Calif. — Terminal controllers that allow Ascii terminals to access IBM 3270 applications programs by emulating 3270 controllers helped Boole & Babbage, Inc. to link its far-flung network of employees while saving time and money.

Many companies with headquarters in one city provide service to customers via staff in branch offices located across the country. Relying on an IBM mainframe computer at the home office for important information, employees located elsewhere need a way to access the computer.

An IBM 3270 terminal provides obvious access. However, prohibitive costs of the hardware equipment and leased lines, as well as their limited availability, are causing many managers to look elsewhere for more cost-effective access methods.

Robert Ford, vice-president, engineering, at Boole & Babbage, is one manager who found a solution.

Boole & Babbage employs a staff of highly trained software engineers. The company and its centralized IBM 4300 computer are located here in Sunnyvale but many of its engineers are not. Located as they are in other cities throughout the country, these engineers develop IBM applications programs such as IMS, CICS, TSO and SPF, necessitating daily access of the computer for several hours at a time.

A few of the engineers have terminals using IBM 3270 protocols, providing access. Most do not. Realizing that the purchase of IBM hardware and leased lines for remote communications would be expensive, Boole & Babbage began a search, headed by Ford, for a cost-effective solution to its problem.

Ford realized that relocation to Silicon Valley was not the answer. "Many of our engineers have families and are settled in their homes. And, plainly speaking, relocation costs can be prohibitive, especially in the Silicon Valley area," he said.

The solution to the problem was found in T7 and T8 Terminal Controllers, manufactured by Datastream Communications, Inc., Santa Clara, Calif.

Datastream's controllers allow

(Continued on Page 48)

Transmits at 168K Bit/Sec

GDI Announces Network Mux

NEW YORK — An asynchronous/bisynchronous network multiplexer that is said to move data faster and more efficiently than any other available product was introduced here by General Datacomm Industries, Inc. (GDI) recently.

Called GEN-NET 1262, the product is capable of transmission speeds up to 168K bit/sec on up to four composite links and has high buffer storage and 96-channel expansion capability, according to GDI.

The unit is available in either eight- or 24-channel modes and features down-line and up-line loading, front-panel programming in English and the elimination of internal strapping, switching and crossover cables, the company said.

GEN-NET's components include two plug-in printed circuit cards and a power supply in either 3½-in. or 7-in. rack-mount enclosures. The multiplexer also features nonvolatile memory, automatic channel programming upon insertion, full flow controls, multiple aggregates, local echoplex, password protection, channel priority, built-in diagnostics and dial-up modem support, GDI noted.

The basic unit, excluding channels, is priced at $5,400. Each channel is priced at $250. First shipments are scheduled for March. More information is available from GDI, One Kennedy Ave., Danbury, Conn. 06810.

Sharing Device Links Four Units

SASKATOON, Sask. — Develcon Electronics, Ltd. has announced a data channel sharing unit said to permit up to four data communications devices or terminals to share a single channel to the host computer in a local data environment.

The Model DS848A accepts both synchronous and asynchronous operations at speeds up to 19.2K bit/sec. It can be configured as a four-into-one modem-sharing or port-sharing unit, according to a spokesman.

The user can link four devices to the DS848A to share a fifth channel. Polling messages from the common channel are broadcast to all four devices. When one device responds, it is granted a private communications path to the common channel for the duration of its message, the vendor said.

The DS848A is available in both a desktop model, costing $920/unit, and a 19-in. rack-mountable (DS848AR) model for $875/unit. Develcon Electronics is located at 856-51st St. E., Saskatoon, Sask., Canada S7K 5C7.

Package Converts Ascii to IBM SNA

WOODLAND HILLS, Calif. — Protocol Computers, Inc. has introduced a protocol conversion software package that allows Ascii conversion to IBM 3270 Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) through X.25.

The 1076X/73SX is a pair of interfaces said to permit micros, personal computers, Ascii CRT terminals, hardcopy keyboards printers and other Ascii devices to communicate with an IBM SNA/SDLC host through X.25 public packet networks.

The interfaces are sister units that work in tandem on opposite sides of the X.25 network. The 1076X provides the link between the X.25 network node and Ascii terminals. The 73SX interfaces between X.25 and the SNA/SDLC host that appears to the host as up to eight IBM 3274 SNA/SDLC controllers.

The 1076X starts at $4,500; the 73SX costs $5,500 from Suite 100, 6150 Canoga Ave., Woodland Hills, Calif. 91367.

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Ramtek Expands 6211 Terminal Unit

SANTA CLARA, Calif. — Ramtek Corp. has introduced three versions of its 6211 Colorgraphic terminal, which was designed for business graphics, process control and command and control applications.

The three versions are the rack-mounted model (R6211), the 40 Hz interlaced long-persistent phosphor version (6211-03) and the 6221 Colorgraphic Terminal with Digital Equipment Corp. VT100 compatibility.

The rack-mounted version is a raster scan color graphics terminal costing $3,995 minus the monitor. The long persistent phosphor version is said to give high-quality resolution for $4,995 and the 6221 contains 6211 features with VT100 compatibility for $5,995 from 2211 Lawson Lane, Santa Clara, Calif. 95050.

Terminals Get Ansi X3.64

ARMONK, N.Y. — Tandberg Data, Inc. has introduced a block transmission capability to its line of smart terminals.

The block transmission is said to follow the Ansi X3.64 protocol exactly.

The terminals cost $1,875 from the firm, which can be contacted through P.O. Box 99, Labriola Court, Armonk, N.Y. 10504.

Controllers Help Firm Access Programs

(Continued from Page 47)

Ascii terminals to access IBM 3270 applications programs by emulating the IBM 3270 controllers to the host computer. The T7 controller works with up to two binary synchronous communications (BSC) line disciplines at speeds up to 9,600 bit/sec.

The T8 controller operates in point-to-point, multipoint and switched System Network Architecture (SNA) networks emulating an IBM 3274-XC controller. The T8 can also be directly connected to 370 processors.

Datastream controllers support multiple terminals and feature dial-in password security, dual host support and remote dial-in diagnostics.

Reduced Phone Costs

The Datastream controllers also reduce telephone costs by allowing dial-up access rather than using leased lines. Engineers from thousands of miles away can dial into the Datastream controllers from their telephones to access the appropriate CICS, IMS or TSO applications at the Sunnyvale headquarters. This dial-up capability is not available with IBM 3270 terminals.

According to Ford, the Datastream solution provided significant benefits, not the least of which is a 75% reduction in costs. "It's made program development via telecommuting a practical, low-cost reality for us," he said. The firm supplies each engineer with an Ascii CRT terminal costing about $600 and an acoustic coupler.

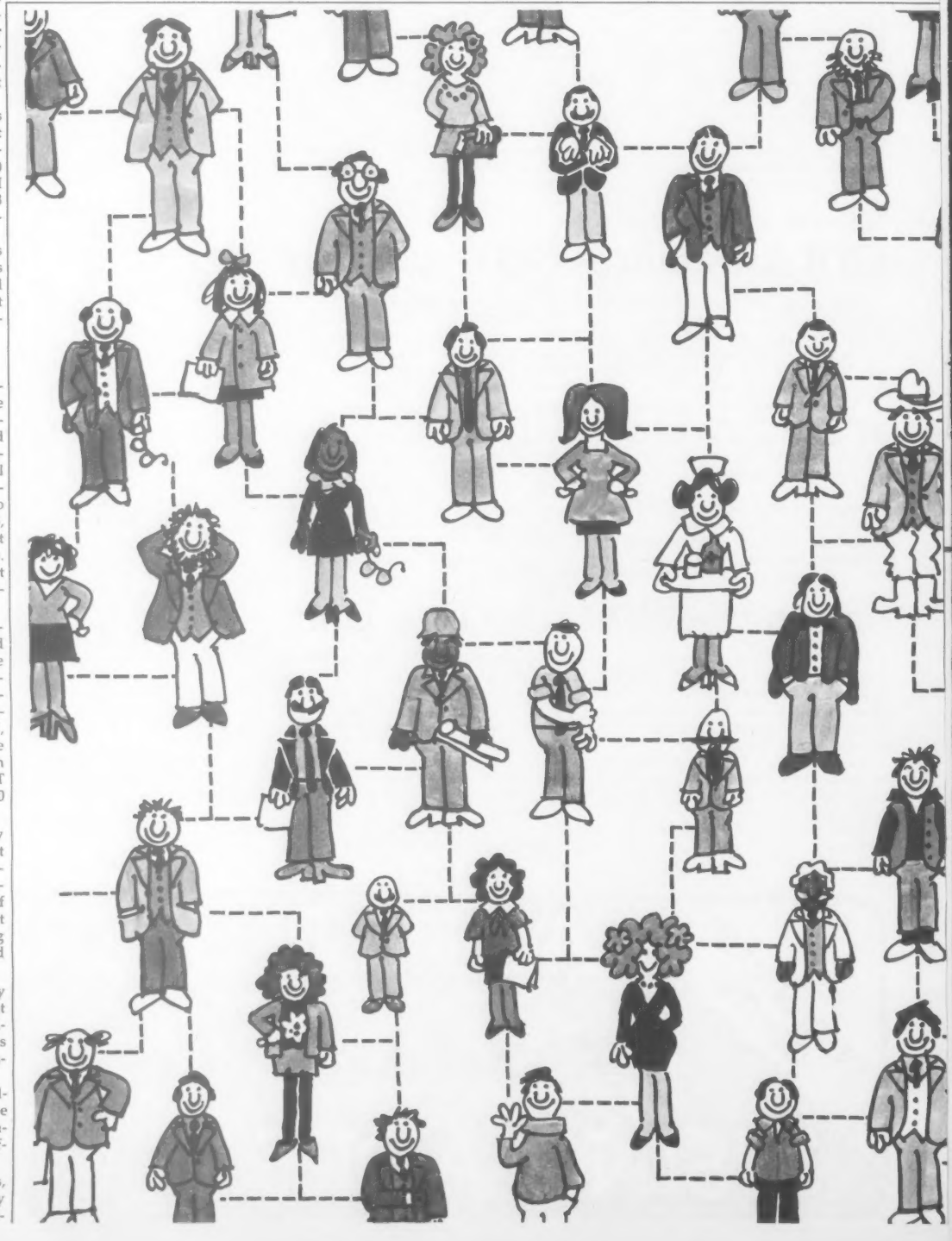
Boole & Babbage is now realizing record throughput with a reduction in development time as well. "The simple dial-in convenience of this approach gives us great flexibility in configuring networks efficiently," Ford noted.

The company is currently testing customer service lot programs in its Chicago, Dallas and New Jersey branches for use by field systems analysts.

Here too, Ascii displays allow inexpensive, real-time access to critical market information from the home office.

Using portable terminals, system analysts can easily transport them for on-site relay and access of pertinent information.

"Datastream controllers provide us with more than we had expected," Ford said. "We ended up with greater flexibility in networking, portability and reduced costs."



Honolulu to Switzerland

WUI Communications Expanded

NEW YORK — Western Union International, Inc. (WUI) has expanded its Database Access and Remote Computing Communications Service (DBS) to provide service between Honolulu and Switzerland.

The service is being provided in conjunction with Radio-Suisse S.A. of Switzerland. DBS uses packet-switching technology to provide terminal-to-computer and computer-to-computer communications internationally.

WUI, a wholly owned subsidiary of MCI Communications Corp., provides telecommunications services, including telex, cablegram, leased line, facsimile and datel, in addition to data base service.

Fees are on an as-used basis. WUI is headquartered at One WUI Plaza, New York, N.Y. 10004.

Atlantis Offers Monitor

MINNEAPOLIS — Atlantis Corp. has introduced a 12-in. amber phosphor data monitor with 800-line resolution and a 16M Hz bandwidth.

The ADP-120A features ac/dc operation and an input impedance termination switch.

The monitor is available for $169 from Atlantis Corp., 720 29th Ave. S.E., Minneapolis, Minn. 55440.

Communications Tool Out For CP/M, MP/M Systems

NEWARK, Ohio — The Information People has introduced a communications software package said to offer information exchange between microcomputers running the Digital Research, Inc. operating systems CP/M or MP/M and a central MP/M system.

Infoshare is said to offer many of the advantages of a star network and allow centralized storage of data. A remote microcomputer can be used to exchange information with an unattended host MP/M system. The remote may also be operated as an MP/M console in the same system.

Suggested one-time charge for a system license is $250, available from The Information People, 443 Hudson Ave., Newark, Ohio 43055.

Dentronix Adds Unit

SANTA ANA, Calif. — Dentronix Systems, Inc. has introduced a CRT terminal that enhances its Data General Corp. emulation product line.

The 400 emulates the DG Dasher D400, including protocol, keyboard layout and colors. Features include two-page memory, horizontal scroll, vertical soft scroll, 81 or 135 char./line, screen windowing, split screen, 64K-byte random-access memory expansion and passthrough printer port, the vendor said.

Priced at $1,650, the 400 is available from the vendor at 2635 Croddy Way, Santa Ana, Calif. 92704.

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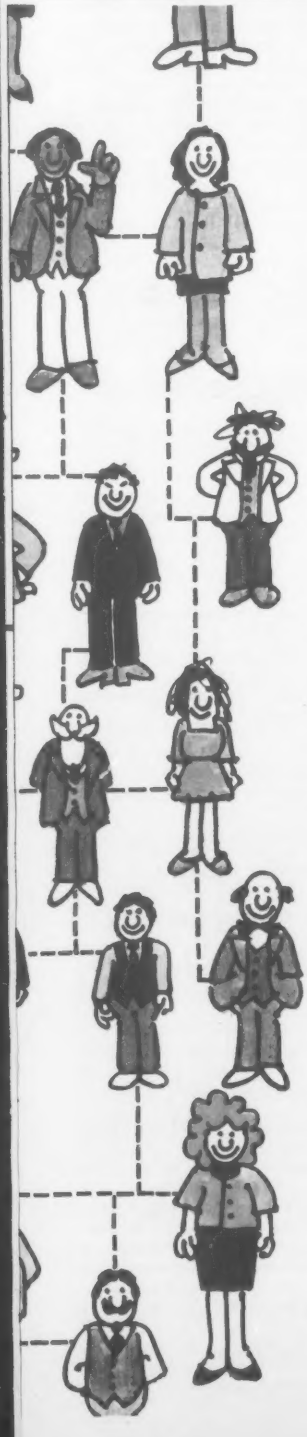

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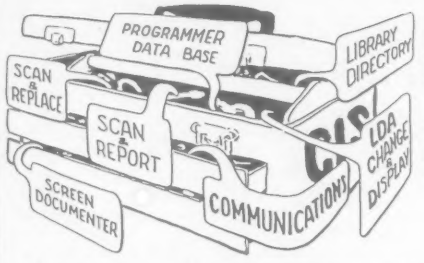

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Protocol Converter Targets IBM System/34, 38 Users

PITTSBURGH, Pa. — Black Box Catalog of Data Communications Devices has introduced a protocol converter that is said to increase the expansion potential of the IBM Systems/34 and /38.

The PQ-4 Protocol Converter Series allows users of the IBM Systems/34 and Systems/38 to twinaxial direct connect RS-232 serial asynchronous Ascii devices to their equipment for bidirectional operation with the PQ-4(B) or receive-only operation with the PQ-4(RO).

The bidirectional PQ-4(B) is available for $2,195, the receive-only model PQ-4(RO) for $1,895. More information is available from Black Box Catalog, Mayview Road at Park Drive, P.O. Box 12800, Pittsburgh, Pa. 15241.

Units Supported For Prime CPUs

WOOD DALE, Ill. — Computronics has introduced software packages that provide support for non-Prime Computer, Inc. terminals connected to Prime systems utilizing the Prime DPTX IBM 3270 emulation software.

The DPTX Driver packages allow the user to communicate with a 3270-compatible host using a variety of commonly available CRT terminals, a vendor spokesman said. The driver works efficiently at 9,600 bit/sec or below and the software allows the user to paint screens quickly, a vendor spokesman said.

The driver for the Lear Siegler, Inc. ADM31 is $1,000, for the Lear Siegler ADM42 $1,200, and the driver for the Televideo, Inc. 950 terminal is $1,700. More information is available from Computronics, 130 N. Ash, Wood Dale, Ill. 60191.

NCR Users Get Security System

MINNEAPOLIS — Century Associates, Inc. has introduced a terminal security system for users of the NCR Corp. B Series and NCR VRX operating system. The software package runs under the NCR financial package, Focis.

The Focis Terminal Security System features a sign-on command with a unique password, limited access to assigned terminals and limited Focis transaction codes, according to a spokesman.

The package will log off users that leave their terminals unattended and will accept sign-ons during banking hours only, a vendor spokesman said.

The package is available for $3,000 from Century Associates, Inc., 1101 W. 80th St., Minneapolis, Minn. 55420.

Quad Board Debuts For PDP-11s, LSI-11s

HUNTSVILLE, Ala. — General Digital Industries, Inc. has introduced a single quad board that was designed to unburden the Digital Equipment Corp. PDP-11 and LSI-11 minicomputers from serial I/O processing.

The Serial Line Controller (SLC) is said to provide high-speed buffered direct multiple access to the host computer memory. It has an onboard Motorola, Inc. 6809 microprocessor and 60K bytes of local random-access memory. Asynchronous, byte synchronous or bit synchronous modes of operation are individually selectable for each of the two serial ports.

The SLC is available for $2,495 from General Digital Industries, 7702 Governors Drive, Huntsville, Ala. 35805.

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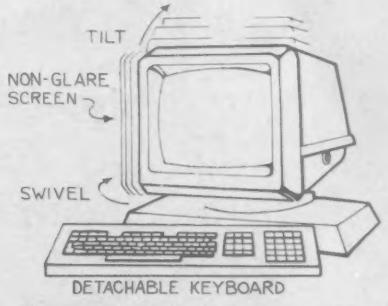

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A True Data Base Environment

How to build information systems that reflect a companywide view of your data resource — and break away from the old file-oriented approach.

BY DAVE ACKLEY

Many of today's methods for applying data base technology were originally created for file-oriented systems and later adapted to data base. However, this adaptation has generally resulted in a misapplication of outdated structural approaches to the conceptually different data base environment. The traditional information systems design process needs changing in three fundamental respects: first, to separate data base design from information systems designs; second, to redefine information systems boundaries; and third, to improve the way information systems development projects are prioritized.

A new approach is necessary to produce systems that take full advantage of data base capabilities. Existing methods fail to support the data base goal of providing shared access to common company data to all users who need it. Adequate techniques are available for designing data bases, but information systems development practices still lag behind.

Only a global information planning structure can make it possible to specify manageable boundaries for information systems development projects. An information systems architecture also provides a tool for preparing an effective migration plan for moving to a true data base environment.

File-oriented systems have been the mainstay of computer applications since the days of punched cards. Data files have been tailored to provide just the data needed by the information systems' application programs, in their unique format. However, with the development of on-line disk storage and its widespread use to make company data more readily accessible, file-oriented systems have gradually become inadequate. As the volume of company data has increased and the need to share that data has accelerated, the rigid data structures of file-oriented systems have become a handicap and a deterrent to new applications development.

Data bases and data base management systems (DBMS) were developed to overcome the handicap of

IN DEPTH

file-oriented systems. Data base technology was intended to serve multiple applications, reducing the need to store data in redundant information systems files. The same data could be accessed by many different information systems for different applications — and even for new applications yet to be defined.

When companies first began to use DBMS, they proceeded cautiously, implementing one data base-oriented information system at a time. This allowed both the users and members of the management information systems (MIS) department to become familiar with the new concepts gradually, without disrupting the whole MIS operation.

'The original promises of data base are seldom being fulfilled. Data independence for application programs is not being achieved, and data is still thought of as "belonging to" particular areas of the company; it is not managed as a company resource.'

However, this seemingly prudent approach resulted in application-oriented data base systems, each of which focused on only one particular area of the company. These systems provided some of the benefits of data base, but lacked the required flexibility for broad sharing of data in other areas of the company and thus failed to overcome one of the most severe limitations of the original file-oriented systems.

As data base technology progressed, the idea of managing data as a company resource, separate from the systems that use the data, became a goal. If data could be organized around company business subjects, instead of being tailored to individual application areas, the resultant structures would be more stable and shareable by everyone. A method was needed to identify these company business subjects, to provide an overall blueprint for data base design. Such a method would have to proceed from a top-level business perspective in order to sort out, from among all of the user requirement details, the major business subjects about which data is needed.

Top-Down Planning

A number of top-down planning techniques have been devised to aid planning teams in developing data bases that are oriented toward the basic company business subjects. One of the earliest was IBM's Business Systems Planning (BSP), developed in 1975. BSP led the way by introducing the concept of companywide data planning, involving company management in the data and information systems planning process, broadcasting the idea of managing

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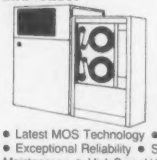

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data as a company resource and introducing a top-down procedural rigor into what used to be an uncoordinated collection of parochial design processes.

Since then, other methods and systematic approaches have appeared, and the idea of building a comprehensive plan for company data has gained widespread acceptance. However, the original promises of data base are seldom being fulfilled. Data independence for application programs is not being achieved, and data is still thought of as "belonging to" particular areas of the company; it is not managed as a company resource.

In general, this lack of success has been due to one of the following:

- The basic concept of managing data as a company resource, separate from the information systems that use it, has not yet been implemented in terms of a delineation of responsibility between the data administration organization and the systems development projects.
- Information systems development projects still tend toward the pre-data-base idea of trying to encompass all sources and uses of "their" data within their analysis. Instead, project leaders should recognize that data bases are to be shared by multiple systems across the entire company to serve the various users who need access to company data.
- Information systems development projects are not being properly prioritized, with regard to source data availability and migration sequence, for transition from existing systems and data files to a subject data base environment. Systems development projects are usually scheduled according to a perceived need for new capabilities (often politically influenced), with little regard for whether the source data to support the systems can be made available.

A New Approach

The process of designing information systems for a subject data base environment involves more complex factors than did traditional systems design. In addition to systems analysis and design, there are now sophisticated logical and physical data design methods to be considered, as well as data dictionary standards.

A new information system cannot be planned in isolation: It must be conceived and orchestrated with the plans for other information systems and scheduled in concert with a data base development plan. In scheduling data base and information systems development, the organization must evaluate the adequacy of existing data files and make arrangements for their continued maintenance during the lengthy transition to new data base systems.

Managing data as a company resource requires coordination of all data and information systems development tasks relating to both old and new systems.

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base environment, the separation between management of company data and management of the systems that use the data must be clear. The organization and management of company data become the responsibility of data administration. Information systems development is still the responsibility of project development teams, but there is a difference in the way systems data structures are defined.

Each information system development project team performs the detailed systems and data analyses and defines the user views of data that must be made available. In this way, the project team identifies the logical views of company data that are required by a particular information system, without dictating the design of the company-level subject data bases.

Within the framework of subject data bases and their data entities, the data administration organization can then integrate the logical views of data required by this information system project with those of other projects, to create a composite company view of the data. The complete company view of data is thus developed over time and results from the collective synthesis of all user views from all information systems projects as they are designed. It is this company logical view of data that is translated into physical data base design.

The project team concentrates on using and applying company data for the project's particular user information requirements, while the actual design of company data base structures is left to data administration.

The data bases and the information systems are viewed as separate mechanisms. As illustrated in Figure 1, the data bases provide the repository for all the data needed to operate and manage the company, while the information systems provide the delivery vehicles by which the data is captured, accessed, retrieved and transformed into the information needed by users who perform the various company business activities. Company data is managed and maintained apart from information systems, in subject data bases.

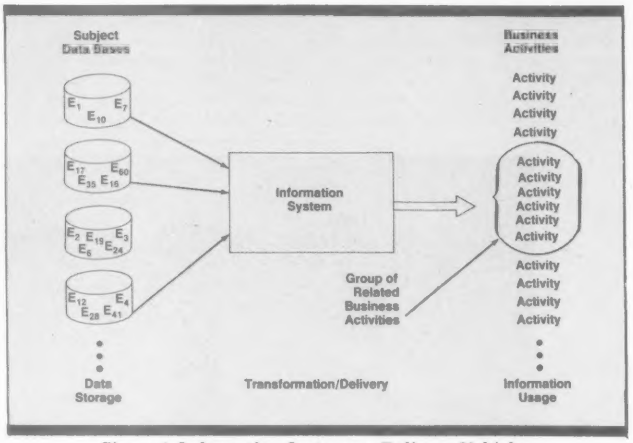

Figure 1. Information Systems as Delivery Vehicles

Outmoded Concepts

Subject data bases in a true data base environment make it unnecessary to think of company data as actually being transferred from business activity to activity, as in traditional file-oriented information systems design methods. Each business activity can now be viewed as accessing the data it needs directly from the subject data bases, instead of receiving it as a transmittal from another activity.

Since the data no longer needs to "flow" from activity to activity (as in "data flow" diagrams), it is no longer necessary for an information systems project team to be directly concerned with where the data originates. The team can concentrate on what information is required within the immediate area of the company being served and how the company data is to be used and applied to provide that information.

In the traditional file-oriented environment, the development project team often found it necessary to include all source data acquisition within their system design. These information systems had names such as "customer data system" or "personnel data system," indicating that everything about that type of data was included in the information system and its files. As a result, the scope of the project usually cut across wider areas of the company than could be effectively managed within a single information system. Projects overlapped, and their teams ran into conflict over who should deal with particular areas of the company.

In a true data base environment, an information systems project team can concentrate on the needs of a specific user area of the company, dealing only with such source data

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collection as happens to fall within that particular area. "Customer" or "personnel" might be the names of subject data bases, and many information systems would access those same data bases to serve various groups of users throughout the company.

A project team designing this kind of information system assumes that the data it needs is contained in the subject data bases. It is not this team's responsibility to acquire source data for the subject data bases from other areas of the company: The team need only identify its own required user views of data.

Data Administration

With multiple information systems projects in various stages of planning and development, only a centralized function can provide the necessary coordination of source data planning, and this responsibility falls naturally on data administration. Management of data as a company resource encompasses not only structuring and organizing data bases, but it also encompasses coordinating and planning source data acquisition to maintain the contents of those data bases in a current state.

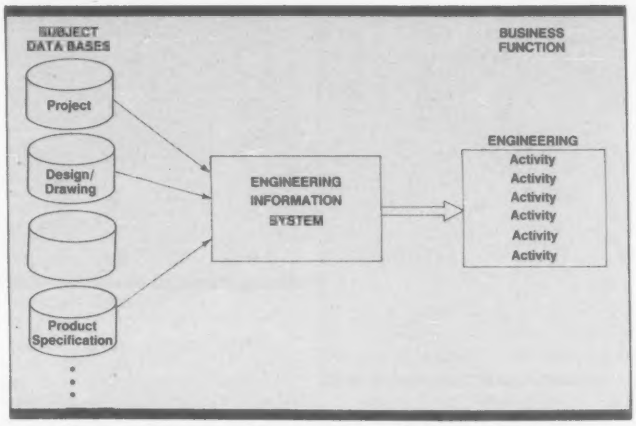

Figure 2. Information System Services Single Business Function

Under this approach, the data administration function is responsible for ensuring that the necessary source data is made available to maintain those data bases that will be accessed by each new information system being developed. Source data availability now becomes a major factor in prioritizing information systems projects, and this implies active participation by data administration in scheduling system projects.

This shift in responsibility is fundamental to the concept of data base, which is to organize and manage company data in such a way that it is available to all who need it. When an information systems project is being designed to serve one group of business activities, but needs data whose source lies in another area of the company, it no longer makes sense for that same project team to determine how the source data will be collected and provided.

Since multiple information systems projects must all share the same company data, they cannot all be responsible for capturing the same source data. Only a separate central function, such as data administration, is in a position to track and schedule all of the company's upcoming source data collection requirements and to coordinate source data availability with project scheduling.

Scope and Boundaries

Building on the basic concept that multiple information systems all share the same company data base structures, a narrower and more effective scope for individual information systems can be specified. There is no longer a need to extend the scope of a particular information system across wide areas of the company, nor to acquire needed source data or to attempt to serve all users who may ever need access to that data. Each information system can be designed to focus on one particular user area without excessive concern about all of the other areas where users may also need to share some of that same data.

An information systems project development team can concentrate on the information requirements of a group of activities within a single business function, such as engineering, manufacturing or sales. Others outside that particular function may be allowed to use the resulting information system, but the system can be designed specifically for the users within that function's group of related business activities, without having to consider all other possible uses of that information in other parts of the company. Each systems development project focuses on activities within a single business function of the company (see Figure 2).

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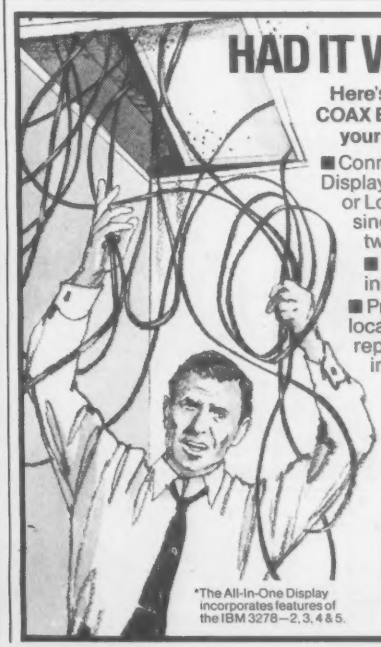

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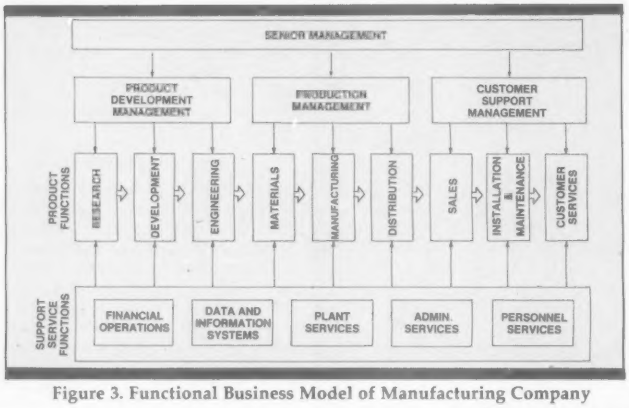


Figure 3. Functional Business Model of Manufacturing Company

company are adequately covered by these more narrowly focused information systems, an overall structural blueprint is needed, showing where each individual system fits into the scheme of things. If the individual systems are relieved of the responsibility for other uses of the data they employ, there must be some other structural mechanism to prevent voids and overlaps in information systems coverage.

Information Systems Architecture

The information systems architecture provides the global delineation of all systems required to operate and manage the company, by defining information systems which:

- Serve a group of closely related business activities that fall within a single business function.
- Communicate only with subject data bases, not with other information systems.
- Have clearly defined system and project boundaries.
- Are manageable as implementation projects and maintainable as operational systems.
- Collectively extract data from the subject data bases and transform it into the information required by all users to perform business activities.
- Collectively capture all of the source data needed to maintain the subject data bases in a current state.

The top-down data planning methods mentioned earlier did not fully incorporate the fundamental premise that subject data bases, not information systems, make common data available and shareable throughout the company. Consequently, their resulting information systems have still tried to encompass too broad an area of the company within their domains. The boundaries of these information systems have been based on which data is being used, rather than on which business activities are being served.

In a true subject data base environment, each information system is tailored to access whatever subject data bases are necessary to serve a group of closely related business activities, that is, a single business function. To develop an appropriate information systems architecture, it is first necessary to identify the basic company

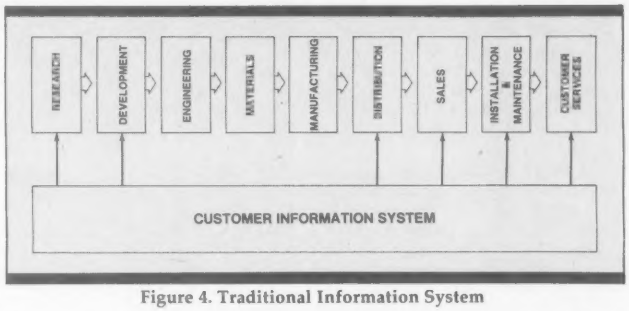
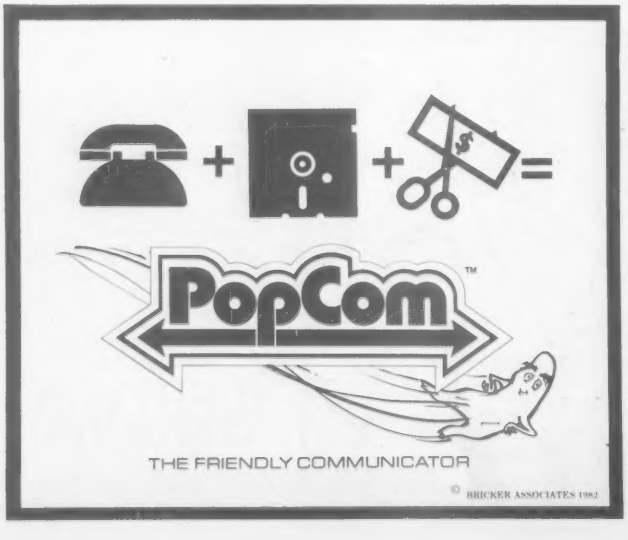


Figure 4. Traditional Information System

business functions. Figure 3 illustrates the business functions for a manufacturing company that services its own products. Each of these functions requires access to its own unique combination of company data, and each function defines a corresponding information system, in terms of scope and boundaries.

Figure 4 applies the same business model to portray a traditional information system, which attempts to cover everything about customer information, its source data collection and all the major uses of customer data. Such a traditional system is very broad, encompassing multiple business functions across very different areas of the company.

Figure 5 examines a portion of the same business in a true data base environment. Here, the information systems each serve a single business function, while a customer data base can be seen to provide the mechanism for sharing customer data among all affected functions. There is no longer a "customer information system" at all, and the individual systems that replace it deal with much more than just customer data. For example, the sales information



system uses customer data in conjunction with work order and other data, and the installation information system combines customer data with both work order and shipment data.

Once this new understanding about information system purpose and scope is accepted, the information systems architectural design takes on a very different structural theme. Its orientation is no longer toward the type of data being used, but focuses on the information requirements of the groups of business activities being served. It becomes much more closely related to the functional nature of the company and can be directly patterned after a functional model of the business.

Need for Migration Plan

The information systems architecture provides a blueprint for all information systems that eventually must be developed as part of the data base environment. However, this blueprint shows only the overall design structure and says nothing about the sequence for developing systems. Priorities for the systems projects must be established by another mechanism.

If a company were starting from scratch, with no systems at all, its systems development project priorities would not be affected by the adequacy or inadequacy of existing systems. However, a company large enough to contemplate top-down data planning is not starting from scratch. It has long since developed efficient systems upon which its day-to-day operations depend and could not instantly develop replacements. Given the complexity of company operations and the availability of systems development resources, only a gradual migration from existing systems to the new systems architecture is feasible.

To prepare for the transition from traditional file-oriented information systems and application-oriented data bases to a company-oriented subject data base environment, a company must first develop a comprehensive migration plan. Such a plan involves maintaining existing systems and data files, while gradually developing the new company-oriented subject data bases and information systems in a parallel environment.

A key factor in determining a workable migration sequence from old to new systems is the availability of source data for the subject data bases, which will be accessed by each new information system as it is developed and becomes operational.

Source Data Requirements

The information systems architecture specifies the overall boundaries of each information system in terms of the business activities served. The top-down planning method that develops the information systems architecture also identifies which data entities in the subject data bases will be accessed by each of the resulting information systems. This high-level data requirements definition is sufficient for determining the type of data required by each system in terms of the subject data bases and their entities. It then provides a basis for identifying where in the company that data is now being, or should be, collected.

Each new information system will require the availability of current data about particular data entities, which is stored and maintained in subject data bases. A key factor in planning for a new information system is deciding where and when the source data will be obtained.

For a given information system, it is unlikely that more than a small percentage of the data it uses will be collected within the same activities it serves. If the system does not collect its own data, some other system will have to acquire it.

Before a decision can be made to proceed with developing a new information system, there must be an analysis to identify the business function or functions where the data to be used originates. A further analysis is needed to determine whether a system to collect that data already exists or will have been implemented by the time the system in question is ready for operation.

This requires careful planning from the start, before any new systems are developed. Recognition of this dependency on the availability of source data introduces a new requirement into the project prioritization and planning stage, during which care must be taken to determine when and how the required source data for each new system will be obtained.

Until a large portion of the new information systems have been developed, much of the source data required by the new subject data bases will most cost-effectively be obtained from existing data files, even

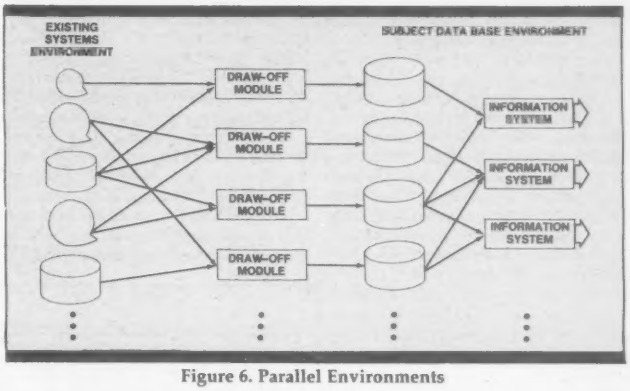


Figure 6. Parallel Environments

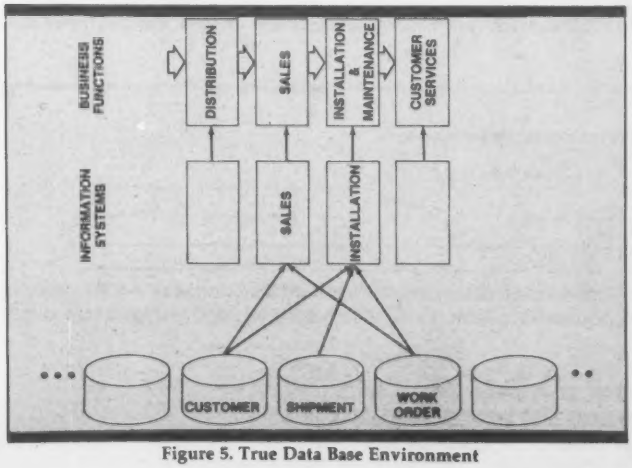


Figure 5. True Data Base Environment

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though their data structures will seldom be in the required format.

As a way of getting started, it will usually be feasible to draw a major part of the needed data from existing data files, to be reformatted into the new subject data bases by means of special program modules that perform the necessary file draw-offs and data restructuring. Figure 6 (on Page 59) illustrates this draw-off of data from the old to the new environment. In time, as additional information systems are developed in the areas of the company where the source data originates, the draw-off programs can be replaced by more effective and complete source data collection routines.

For some of the new information systems, certain required data may simply not be available, either from within the existing data files or from among the new information systems projects under development. In this situation, a special data collection module may have to be designed. Depending on the timing and scheduling for developing a new information system for the business function where the source data must be collected, the data collection module may become integrated into another information systems project or may have to be designed as a temporary stand-alone module.

Eventually, when the local information systems for those groups of business activities are developed, such temporary modules will be replaced. Temporary data collection modules keep the new information systems boundaries clean, since these modules use entirely separate designs that do not compromise the structure of the new information systems.

It is likely that some "throwaway" data collection modules will have to be developed to facilitate an effective transition to the new data base environment, just as temporary draw-off modules will be developed to bring data across from the old environment.

Status of Existing Systems

The first step in planning the migration to a true subject data base environment is to determine how each of the existing information systems relates to the new information systems architecture.

1. How do the boundaries of the existing system compare with those of the information systems architecture?

2. In terms of data usage, which areas of the information systems architecture correspond to the areas served by the existing system, and how adequate is the existing system in meeting those user information requirements?

3. In terms of source data collection, which areas of the information systems architecture correspond to the places where data is captured by the existing system, and how adequately do the existing systems capture source data from that area of the company?

The detailed procedure for carrying out this mapping process involves decomposing each existing information system into modules, such that the mapping of a given module into the information systems architecture has minimal overlap across the architectural boundaries.

This reduces the scope of the existing system and creates units that more closely align with the company business functions. An existing system might break down into several modules, each of which could map into a different area of the information systems architecture.

There will be major differences between the boundaries of the information systems architecture and the boundaries of the existing systems. Existing systems will probably extend across wide areas of the company, while the new information systems each focus on the information requirements of a single function of the company. Because of these differences, the mapping process will often separate an existing system's source data collection from its main usage.

In a true data base environment, there is no longer a need to combine source data collection and usage under the same information system design. This analytical decomposition of existing systems makes it possible to compare what exists today with

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the new information systems architecture.

When the existing information systems have been decomposed into modules and mapped into the information systems architecture, a migration plan can be prepared. This plan will be based on a comprehensive picture of existing systems' adequacy, new information requirements and the realities of source data availability.

By working with the modules of existing systems instead of entire systems as indivisible units, a company can compare the old information system's capabilities and structure with those of the new system. The practicalities of continuing to collect source data via existing systems can be traded off against the cost of developing new data collection modules and the urgency of meeting new user information requirements.

'Augmented by source data collection analyses, the information systems architecture provides a comprehensive planning aid for comparing the cost and feasibility of developing the new information systems, depending on which systems are developed first.'

Planning Aid

Augmented by source data collection analyses, the information systems architecture provides a comprehensive planning aid for comparing the cost and feasibility of developing the new information systems, depending on which systems are developed first.

It facilitates a value, cost and feasibility comparison of alternative information systems development priority sequences, considering both the perceived need for new information and the practicalities of various sequences of development.

With the information systems architecture as a common framework for relating existing capabilities and source data availability to new information systems requirements, a practical schedule can be prepared for migrating to a true data base environment.

This schedule, together with the information systems architecture, provides a vehicle for technical analysis and management decisions on both the urgency of each new system and the timing and feasibility of its development.

In Summary

A top-down planning approach is needed to develop information systems that are designed for a true data base environment. By working from the perspective of the company as a functional business enterprise, a stable architectural design for company information systems can be prepared.

This information systems architecture becomes a common frame of reference for comparing the status of existing systems capabilities with new information requirements.

It provides a comprehensive planning device to account for the availability of source data to support the new subject data bases, as well as a tool for defining a practical information system project development schedule.

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About the Author

Dave Ackley is a senior consultant with Holland Systems Corp., Ann Arbor, Mich., which specializes in methods and software for comprehensive planning of company data, information systems and computer technology.

He has more than 20 years' experience in the computer field, with current emphasis on data resource management and office automation.

He holds a B.S. in electrical engineering from Stanford University. His Ph.D. and MBA were completed at California Western University, with specialization on data base long-range planning and cost/benefit analysis.

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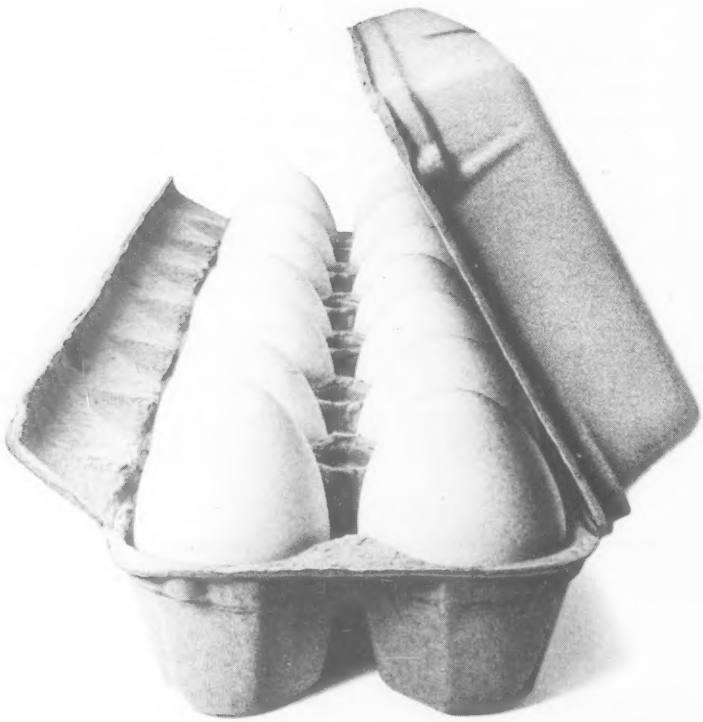

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Compatible With IBM CPUs

Intel Develops Disk Memory System

SANTA CLARA, Calif. — Intel Corp. has developed an IBM-compatible semiconductor disk memory system that reportedly reduces on-line terminal response time in high-volume operations by 50%.

Compatible with IBM's 370 series, 30 series, 3080 series and 4300 systems, the Fast-3825 disk memory system can access and transfer data at up to 4M byte/sec and handles paging in an average MVS paging environment up to five times faster than IBM's 3880 Model II disk system, the company claimed.

While it is half the size of its predecessor, the 3805, the Fast-3825 has more memory with capacities ranging from 12M bytes to 144M bytes. The system can diagnose and correct double-bit errors, move stored data from defective memory areas to spares for "self-healing" and record errors for later analysis, according to a spokesman.

The new disk memory system is compatible with several operating systems. Using a fixed-block architecture, the Fast-3825 operates more efficiently than the 3805, under the VM/370 as well as DOS/VSE and Burroughs Corp. formats, the company claimed. Software support for all IBM operating systems that support the IBM 2305 fixed-head storage facility is distributed automatically, a spokesman said.

Despite the recent decisions by Storage Technology Corp. and Control Data Corp. to discontinue production of disk drives using fixed-block architectures because of poor user acceptance, Intel spokesman Steve Page feels Fast-3825 can carve out a niche in the marketplace. "We decided to go with a fixed-block architecture because it was one way of getting the user more usable megabytes out of a box that had those megabytes resident. It provides the most bytes per dollar," he explained.

Options available on the system include a data-streaming feature capable of transferring data at 3M byte/sec, a 2-byte width transfer, two-channel switch and additional storage increments of up to 144M bytes.

The Fast-3825 ranges in price from $120,000 for the basic 12M-byte configuration to $815,000 for the fully featured model. More information is available from the vendor's Literature Department, K-5, 3065 Bowers Ave., Santa Clara, Calif. 95051.

Apollo Introduces 32-Bit Micro To Compete With VAX-11/780

BOSTON — Apollo Computer, Inc. unveiled here recently an under-$11,000, 32-bit virtual memory microcomputer for scientific applications that the company said will compete with Digital Equipment Corp.'s VAX-11/750 and -11/780.

Billed as a "desktop mainframe," the DN 300 is a 68010-based system intended primarily for applications involving computer-aided design/computer-aided manufacturing (CAD/CAM), design analysis and computer-aided software engineering, according to a spokesman for the vendor. First shipments of the system are expected to be made in early March.

Besides the DN 300, other introductions included:

- DSP80 Server Processor, an intelligent peripheral and communications server that improves the DN 300's performance by off-loading peripherals and communications tasks.
- Domain X.25, a communications subsystem that enables the DN 300 users to communicate remotely over the vendor's Domain network.

Apollo's DN 300 Desktop

The DN 300's basic configuration consists of the 68010 chip, which contains 512K bytes of main memory, a 17-in. black and white, high-resolution monitor capable of displaying bit-mapped graphics, a detachable keyboard with 32 function keys, an interface to the vendor's 12M bit/sec local-area network, two RS-232C serial I/O ports and the Aegis operating system.

Options for the system include main memory expansion up to 1.5M bytes using 64K random-access memory (RAM) chips, a 34M-byte Winchester disk drive and a touchpad cursor control. Optional software includes the full Ansi standard Fortran 77, Pascal, and C languages, the complete Siggraph Core graphics library and AUX, a Unix System III-based operating system.

"Just as the goal of office automation vendors is to put a computer terminal on every office worker's desk, our goal is to enable every technical professional to have a desktop mainframe," asserted John Poduska, Apollo president. He added that in concert, the DN 300, DSP80 Server Pro-

(Continued on Page 66)

IBM 4300 Software-Compatible

Cambex Adds CPUs to 1600 Line

WALTHAM, Mass. — Cambex Corp. has added two IBM 4300 software-compatible processors to its 1600 computer series.

The vendor claimed the two processors have twice as much memory capacity as comparable IBM 4300 machines.

Both Cambex processors feature a microprogrammed, bus-driven architecture that allows the CPU, main memory or I/O channels to be field-upgraded through printed circuit board changes, the company noted.

Explaining the advantages of a microprogrammable architecture, marketing vice-president Gene Larkin said, "Users can load the microcode through a special assembly language into a separate memory. With this capability, you can run the instructions in the microcode much faster than you could in main memory." Both units have a microcode control storage that supports up to 144K bytes.

Both 1600 processors use emitter-coupled-logic hardware circuits with a 50-nsec cycle speed. The units' standard I/O channels include a byte multiplexer and up to four and five block multiplexer channels for the 1636-10 and 1641-11 processors, respectively.

Memories of both units use error-correction techniques to correct automatically all single-bit errors and detect double-bit errors. The units both contain redundant arithmetic logic units for comparing results of all functions, a spokesman said.

The 1636-10 and 1641-11 are completely software-compatible with the IBM 370 and 4300 series when running under the DOS/VS, OS/VSI, MVS, VM-370, DOS/VSE MVS-SP and VM-SP operating systems, as well as with all application programs written for the 360, 370 and 4300 systems.

According to Larkin, Cambex will depend largely on "value-added resellers, distributors and OEMs" to market the CPUs, rather than on its direct sales force.

(Continued on Page 68)

Tycom Offers 8088-Based System

Tycom Corp.'s Microframe

LONDON — Heralding it as the first fourth-generation computer, Tycom Corp. has introduced an Intel Corp. 8088-based multiuser system here that has a performance range extending from a mid-range microcomputer to a high-end minicomputer.

Described by some observers of the London computer scene as "future proof," Microframe contains a vendor-developed bus architecture called Versatile Base Bus Connect (VBC) that enables its chassis, which is available in 6-, 12- and 22-slot versions, to accommodate Zilog, Inc. Z80, Motorola, Inc. 68000 and Digital Equipment Corp. PDP-11/70 board-level upgrades.

The 16-bit system, which can support up to 30 users simultaneously, will be available in the UK early this month, but will not be available on the U.S. market until the middle of the year. The company plans to open up its first U.S. office in San Francisco sometime this month.

"Previous generations of mainframe, mini- and microcomputers were in very clear price/performance brackets, and they tended to be manufacturer-specific in terms of the operating systems they would

(Continued on Page 68)

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Lack of User Acceptance Cited

STC Axes 8370 Drive Production

LOUISVILLE, Colo. — Storage Technology Corp. (STC) announced it has stopped production of its 571M-byte 8370 disk drive because of lack of user acceptance. The company said it plans to reassign the 8370's production and engineering resources to meet the demand for its 2.5G-byte 8380 drive, which is expected to reach the market in March.

The major reason there has been little demand for the 8370, according to the vendor, is its fixed block architecture. While this architecture is generally considered to be superior to count key data technology, users have had difficulty integrating it into their distributed data processing networks.

A spokesman for STC believes the market is just not adapting to the fixed block architecture because generally the architecture of data storage is count key data. The problem, he said, is that count key data is very well established in the marketplace, and fixed block architecture was introduced only three years ago when IBM put it on its 4331. The major difficulty in integrating a disk drive using fixed block architecture into a distributed network is migrating files, he continued.

Basically, if you have a computer system that is doing all its data storage based on count key data, but you have one site using fixed block architecture, you aren't compatible even though you might be running all IBM equipment and running under DOS or VM operating systems. But, if you have 10 distributed sites, each with a 4300, and just one of them has a fixed block architecture, you would have to work around that system in everything you did, he explained.

While the spokesman admitted that fixed block architecture is superior to count key data, he said he does not expect the 8370 to make a comeback. However, the effort and money put into development and marketing of the 8370 has not been a total loss. Much of the 8370's technology is transferable to the 8380, he noted.

The list price of the 8380 is expected to range from $70,000 to $100,000, the vendor said from 2270 S. 88th St., Louisville, Colo. 80027.

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Printer Gets Price Cut Of 42.5%

BOSTON — Data Impact Products, Inc. has announced a price reduction on its D-92 dual-mode dot matrix printer from $695 to $399.

The 42.5% price cut was achieved "through further design simplification and manufacturing efficiency," according to the vendor. The dual-mode operation of the printer is said to provide higher speed printing using a 7 by 9 dot matrix font, as well as an 11 by 9 dot matrix font for "near letter quality" documents.

The printer features 100 char./sec bidirectional printing, short-line-seeking logic, friction paper feed, parallel interface, 800-char. buffer and full-character Ascii set.

The firm is located at 745 Atlantic Ave., Boston, Mass. 02111.

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Apollo Micro Released for Science Applications

(Continued from Page 63)

cessor and Domain X.25 "could very well eliminate time-sharing in computer-aided design/computer-aided manufacturing (CAD/CAM) applications."

Poduska said the system, which supports up to 15 concurrent user processes, is ideally suited for large organizations such as General Motors Corp. that "like to buy their hardware on the outside and have their own programmers write the software."

While it is described as a desktop mainframe, Poduska admitted the DN 300 is not comparable to a mainframe in terms of performance, but is similar to a mainframe in that it can process large software programs.

A spokesman noted the system will run application programs that allow engineers to design such things as airplane wings, automobile bodies and printed circuit boards.

When asked to compare the technology and market positioning of the DN 300 with Hewlett-Packard Co.'s recently introduced HP 9000, Poduska sidestepped the question saying he would prefer not to assume what HP's marketing plans were.

Asked the same question, marketing director Ed Zander said HP's proprietary 32-bit reportedly "is faster" than the Apollo processor, but added his company's system is priced one-third to one-half lower than the HP 9000.

Apollo attributes the DN 300's price/performance capabilities to configuring the CPU and 512K bytes of main memory on a single circuit in addition to modular, compact packaging. According to the spokesman, all the CPU, disk control and network interface electronics are contained within the display's enclosure.

The DSP80 Server Processor has its own 32-bit processor, a five-slot Multibus card cage and up to 1.5M bytes of main memory. With the five IEEE-796 card slots and two RS-232C serial ports, the processor can support a range of peripherals including large-capacity disk drives, gateway communications to external networks, line printers and letter-quality printers, according to the company.

The 2M byte/sec processor has an optional software package called General Purpose I/O that enables users to write device control programs in higher level languages.

Single prices for the unit start at $7,000.

The X.25 communications gateway permits Apollo system users to communicate with remote systems as well as with its own Domain network. The new interface adheres to the CCITT communications protocol standards and the ISO Open Systems Interconnection reference model, the company said.

"More and more, large companies are using public data networks to link geographically dispersed engineering groups with distant host computers both in the U.S. and abroad. To do this, they require support for X.25 and related international standard protocols," asserted Jeff Wilson, marketing manager for the communications package.

The X.25 Gateway lists for $15,600.

More information about the products can be obtained by contacting Apollo Computer, Inc., 15 Elizabeth Drive, Chelmsford, Mass. 01824.

Drum Plotter/Printer Added to Plotter Line

COSTA MESA, Calif. — Watanabe Instruments Corp. has announced the addition of a drum plotter/printer to its line of intelligent plotters.

The WX 4731 is a desktop plotter featuring graphics and print modes. It offers four pens, an RS-232C interface and various options including two for plotting area sizes.

It costs $2,490 from 3186-D Airway Ave., Costa Mesa, Calif. 92626.

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Molecular Supermicro Line Extended With 32X, 64X

SAN JOSE, Calif. — Molecular Computer, Inc. has extended its supermicrocomputer line with the addition of two second-generation systems that reportedly provide greater disk capacity and processing speed than the company's existing multiuser products.

The introduction of the firm's X-series supermicros came recently during Digital Research, Inc.'s first CP/M Exposition. It was here that Molecular also announced a 25% price cut for its older Supermicro 8 system and a 30% reduction for its application processors.

Molecular's X-series consists of two models — the Supermicro 32X, an enhanced version of the company's existing Supermicro 32, and the Supermicro 64X, which extends the performance of the firm's older Supermicro 64.

Increased Capacity

Both the Supermicro 32X and 64X provide twice the disk capacity and bus transfer speed and four times the file-processor memory of their first-generation Molecular counterparts, a company spokesman said.

The X-series machines also reportedly boast a 6-MHz file processor, which runs 50% faster than its Supermicro 32 and 64 predecessor.

A minimum 32X and 64X configuration supports a 60M-byte and 136M-byte disk unit, respectively, compared with 30M bytes for the Supermicro 32 and 60M bytes for the Supermicro 64, according to the spokesman.

The second-generation machines also hold 256K bytes of file-processor memory and transfer 400K byte/sec over their system buses, compared with 64K bytes and 200K byte/sec for the Supermicro 32 and 64, the source added.

Related Moves

In related moves, Molecular cut the price of its eight-user Supermicro 8 system from $7,995 to $5,995 as well as the price of its application processors from $995 to $695.

Both the Supermicro 32X and 64X come with a Zilog, Inc. Z80B-based file processor and one or more 4-MHz Zilog Z80A-based application processors, each with 64K bytes of random-access memory (RAM).

One application processor board is dedicated to each X-series system user, according to the vendor.

Performance Option

As an option, users can also specify their X-series configurations to incorporate one or more "performance accelerator" boards, which hold an 8-MHz Intel Corp. 8086 microprocessor and 256K bytes of RAM expandable to 1M byte.

The presence of a performance accelerator in the 32X and 64X adds a 16-bit processing capability to the machines' eight-bit Z80A and Z80B, according to the vendor.

Up to four performance accelerators can be added to the 32X systems and eight to the 64X, the spokesman said.

Like their first-generation counterparts, the X-series systems support up to 32 and 64 concurrent users, will be sold both to distributors and to high-volume end users and will run CP/M and CP/M-86, the source added.

A Supermicro 32X with a 60M-byte Winchester disk system, 500K-byte floppy diskette module and 32 application processor slots costs $18,995, compared with $22,995 for a similarly configured Supermicro 64X with a 136M-byte Winchester disk unit.

Shipments of the X-series machines will begin during the second quarter, according to Molecular.

The firm is located at 251 River Oaks Pkwy., San Jose, Calif. 95134.

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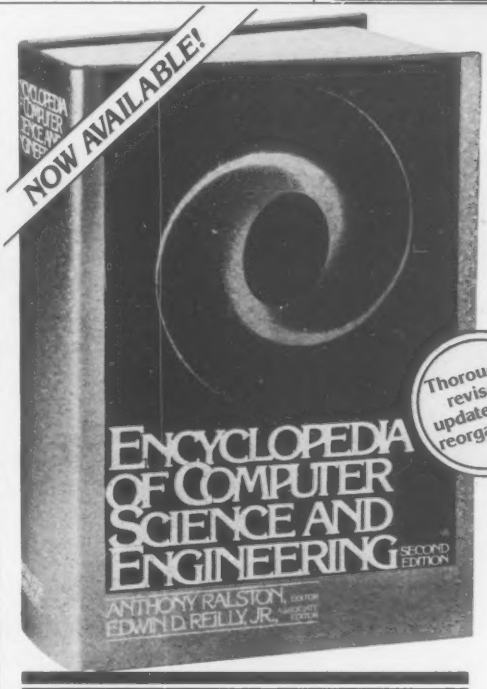

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Tycom Claims a 'First' in Fourth-Generation

(Continued from Page 63)

run. But with Microframe, you have a massive performance span that runs within a single box," marketing manager Peter Williams said, explaining why he feels the system is a fourth-generation machine.

The initial release of the system will run under Microsoft, Inc.'s Xenix operating system, as well as Digital Research, Inc.'s CP/M and CP/M-86 operating systems. Within the next two months, according to a spokesman, MS-DOS Version 2.0 will also be available. In terms of hardware upgrades, the company expects to have a 68000-based board available by the end of March. Pricing on the 68000-based board has not yet been determined, the spokesman said.

Williams noted that historically, most bus designs have been based on a "star-type architecture" containing either one or two processors that feed the peripherals. The VBC architecture, however, has one bus wire "going down the middle, with a number of wires crossing the bus giving its slots a rectangular shape," Williams explained. He claimed that this design offers a greater degree of precision than the S-100 and Intel Multibus architectures.

"What you have got [with Microframe] is a highly specified personal computer with empty slots that can run any other system. You can cease worrying what is going to happen next year or the year after that because whatever happens you can put in the appropriate processor or operating system to take advantage of the changing technologies."

Williams said the system's bus, which communicates at 9M bit/sec, can accommodate a powerful upgrade such as the 68000 and PDP-11/70 because of an additional 100M bit/sec bus that runs down the back of the system. Williams contended that most second-generation computers cannot handle the superior processing power of a board-level 68000.

Another advantage the system's bus architecture offers is its ability to provide up to 100 dumb CRTs with bit-mapped color graphics. The bus' speed and ability to draw off the bus controller's memory make such multiple use possible, Williams said.

Priced at approximately $4,600, the basic configuration is made up of an 8-MHz version of the 8088 chip, two 600M-byte floppy disk drives, 128K-byte random-access memory, expandable to 768K bytes, CRT, keyboard, bus controller and the CP/M or CP/M-86 operating system.

Williams said Tycom plans to be "very aggressive" in its marketing of Microframe in the U.S., saying his firm is now talking with "several major distributors." The company will also be selling the system in Japan, France and Germany.

Further information is available from the vendor at 8-12 New Bridge St., London, England EC4V 6AL.

Portable Cleaning System Out

SUFFERN, N.Y. — A portable cleaning system especially designed for computer maintenance has been introduced here by the Metropolitan Vacuum Cleaner Co.

The Metro Data-Vac will air-sweep paper particles from printers and rid disk drives of dust that can shut computers down, the vendor said. Its suction attachments can fit into all hard-to-reach places and remove even microscopic dirt.

This product costs $55. Further details can be obtained from the vendor at 1 Ramapo Ave., P.O. Box 149, Suffern, N.Y. 10901.

Cambex Adds To 1600 Series

(Continued from Page 63)

"To get the most mileage out of the reps we have, we should be going after situations where the potential for multiple [sales] is greater. Everyone heretofore has thought that the OEM has to have a mini. But as they [OEMs] mature, they may find they would like to get into the IBM marketplace with a 32-bit machine," Larkin said.

The 1636-10, with 1M byte of memory, costs $98,500, compared with $150,000 for a basic IBM 4341 K10 processor. A 2M-byte 1641-11 processor lists for $170,000, compared with $240,000 for an IBM 4341-11 CPU. Cambex is located at 360 Second Ave., Waltham, Mass. 02154.

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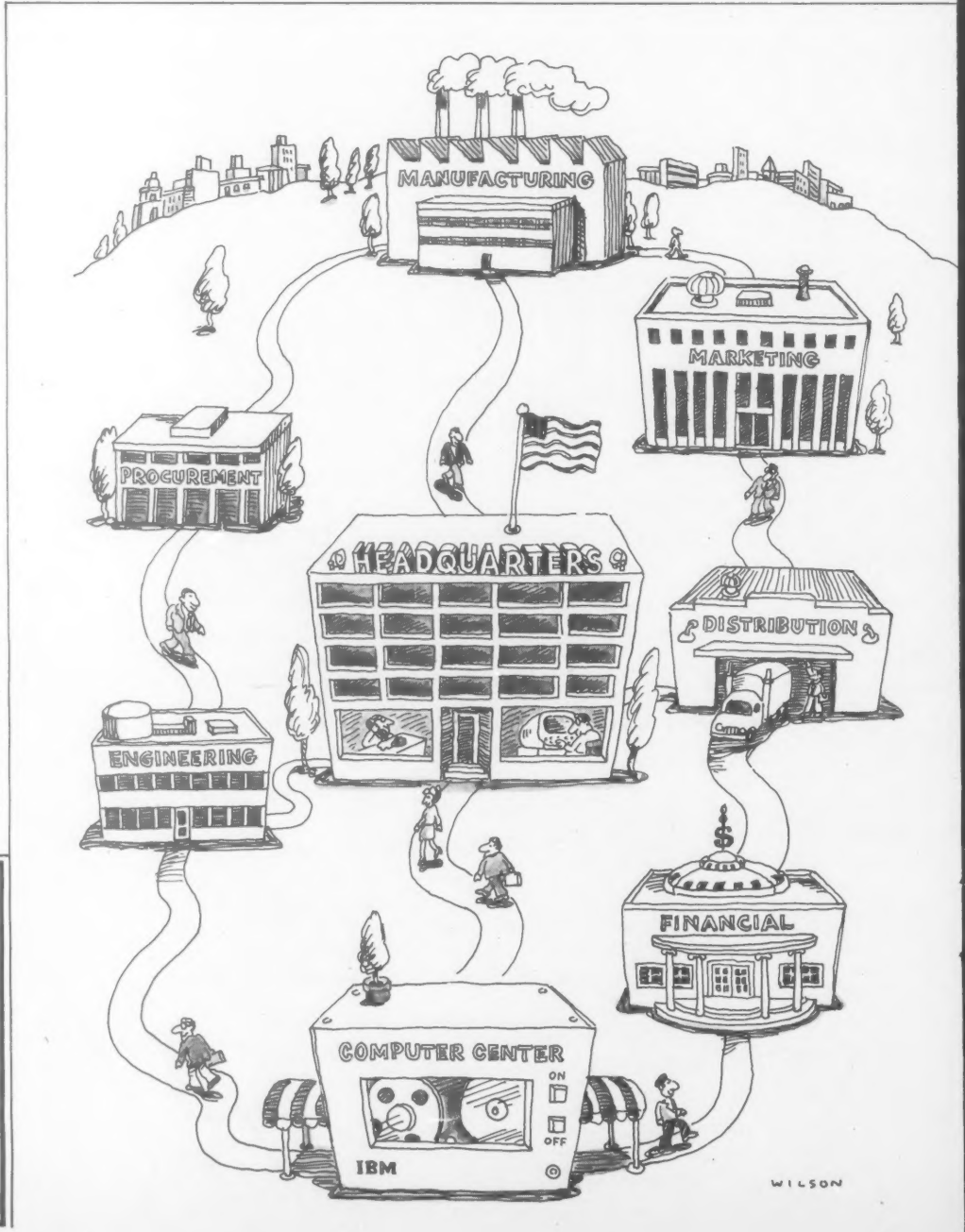

Improved Manufacturing Abilities Cited

Prime Slashes Prices of 550-II-2MC Superminis

NATICK, Mass. — Citing improved manufacturing capabilities and the incorporation of less expensive technologies as the motivating factors, Prime Computer, Inc. has slashed prices on its packaged 550-II-2MC line of supermini computers from 22% to 27%.

The company also announced price cuts on its 750 series as well as on maintenance services for various peripherals.

The new 550-II package now costs $216,480, down from the original price of $268,880. The company has also lowered the price of its Model 750 to $423,600, down from $446,600. Maintenance costs for the 550-II have dropped from $2,490 to $2,281 while Model 750 service charges have dropped from $4,399 to $3,954.

Prime also announced that customer services previously available only for its 2250 system are now available for the company's entire line of 32-bit minicomputers. Those services include the Prime Preferred Service, which offers guaranteed on-site response from 7 a.m. to 7 p.m., and Basic Service, which provides next-day, on-site response from 8 a.m. to 5 p.m., Monday through Friday.

These two services became effective for all new systems on January 18 and will become effective on April 1 for all existing systems.

Monthly maintenance prices for add-on 64K-byte chip memory boards have been reduced by 66%, according to the firm. Maintenance prices on fixed media disks, high-speed magnetic tapes and computer-aided design and manufacturing workstations have been dropped from 19% to 52% while monthly maintenance costs on printers, terminals, communications controllers and software were cut between 10% and 15%.

All price reductions are effective immediately. More information can be obtained from the vendor at Prime Park, Natick, Mass. 01760.

Access' Portable Micro Designed For Zilog's Z80A Microprocessor

SAN JOSE, Calif. — Access Matrix Corp. has announced Access, a portable microcomputer based around the Zilog, Inc. Z80A microprocessor.

Designed for business, education, professional and home use, the system includes a 7-in. monitor, two double-density 5¼-in. disk drives, a detachable keyboard and 64K bytes of main memory. The vendor claims that the system is the first to incorporate all peripherals into a single unit.

In addition, the unit incorporates a high-speed dot matrix printer, a direct-connect modular telephone jack and an internal modem which can operate at up to 300 bit/sec, the vendor said.

The built-in printer delivers hard copy at 80 char./sec and users can print up to 132 char./line on standard-sized paper. In addition to a standard 96-char. Ascii set, the unit is also said to offer graphics capabilities.

The Access portable computer costs $2,495, and comes with Digital Research, Inc.'s CP/M 2.2 operating system and a specialized software package including word processing, spelling correction, data base management and spreadsheet applications. The vendor is located at 2159 Bering Drive, San Jose, Calif. 95131.

Front-End CPU Fits Xerox's Ethernet

SAN JOSE, Calif. — Exelan Co. has announced a board-level front-end processor which is compatible with Xerox Corp.'s Ethernet local-area network.

Called the Exos/101, the front-end processor is aimed mainly at OEMs and systems integrators. The unit is based on an Intel Corp. 8088 microprocessor and comes with firmware and up to 128K bytes of random-access memory. The unit fully implements Ethernet Version 1.0 and is compatible with Version 2.0.

The Exos/101 costs $810 in quantities of 500, the vendor said from 2180 Fortune Drive, San Jose, Calif. 95131.

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OSM Unveils Low-End Zeus, Aimed at Multiuser Market

SANTA CLARA, Calif. — OSM Computer Corp. has announced a low-end version of its Zeus microcomputer.

Called the Zeus4, the unit is aimed at the low-end multiuser market. The system is based on Zilog, Inc.'s Z80 microprocessor and uses OSM's Muse operating system to support up to four users in a segregated operating environment that is compatible with Digital Research, Inc.'s CP/M operating system.

Each user of the Zeus4 controls a dedicated Z80A microprocessor, 64K bytes of main memory and two RS-232C I/O ports. A master Z80A processor module controls the shared resources of floppy and hard disk storage and a floppy disk controller, the vendor said.

The Zeus4 can connect up to four dedicated processors and one master processor through a high-speed parallel, bidirectional, asynchronous interprocessor data channel that is capable of moving data at 200K byte/sec, the vendor said.

A basic processor configuration with 64K bytes of random-access memory, 6.3M bytes of disk storage and 250K bytes of floppy disk storage costs $4,595, the vendor said.

OSM Computer Corp. is located at 2364 Walsh Ave., Santa Clara, Calif. 95051.

EIT Unwraps Two Turnkeys

SOUTH HACKENSACK, N.J. — Electronic Information Technology, Inc. (EIT) has announced two turnkeys, the EIT 6400 and the EIT 4400, for small to medium-size installations.

The 6400 reportedly consists of a Data General Corp. Eclipse computer with 256K bytes of memory, two 16M-byte Winchester drives, eight RS-232C ports and two electronic-imaging terminals with full graphics capabilities. The 4400 system offers the same configuration, except its terminals do not have the graphics options. Both systems can be built up to 16 terminals, the vendor said.

The software package provided with the 6400 and 4400 includes multilevel directory search, background and interactive processing, code conversion and multistring and interactive search and replace.

The 6400 costs $72,000 and the 4400 costs $59,500 from 96 Vreeland Ave., South Hackensack, N.J. 07606.

Tape Drive Unit Out for IBM User

ARLINGTON, Mass. — A tape drive unit designed for the IBM System/34, System/38 and 5280 has been announced by Mannheim, Germany-based Data Elektronik Gmbh.

The tape drive unit Series 5 has a capacity of up to 50M bytes and throughput of approximately 4K byte/sec, the vendor claimed. The controller allows the tape drive unit to be connected to a Twinax cable. This reportedly allows it to be recognized as a workstation by the computer.

The unit includes the tape transport, intelligent controller, software, housing and cabling for the price of $17,550, the vendor said from 1365 Massachusetts Ave., Arlington, Mass. 02174.

Processor Fits Motorola 68000s

LOWELL, Mass. — A hardware floating point processor designed for Motorola Semiconductor Products, Inc. 68000 microprocessor running on the Intel Corp. Multibus or Motorola VME-bus has been developed by Sky Computers, Inc.

The Sky Fast Floating Point (SKYFFP) single card processor is said to be capable of a 3-usec floating point add/subtract/multiply on 32-bit single-precision data and 12 usecs for 64-bit double precision data, according to the vendor.

Besides basic arithmetic operations, the unit reportedly performs square root, logarithmic and trigonometric functions. SKYFFP reportedly requires no modifications on existing Fortran, Pascal or C programs, the spokesman said.

Single-quantity price is $2,200 from Sky Computers, Foot of John St., Lowell, Mass. 01852.

Interface Targets DEC VT125 Users

BURLINGTON, Mass. — Texprint, Inc. has announced the Decolor PI-125, an interface option that allows users of Digital Equipment Corp. VT125 CRT terminals to print graphics or text images on a screen dump basis using Texprint's LA120 hardcopy terminals.

The Decolor PI-125 allows VT125 users to create and view full-color graphics images without the need for an additional color video monitor because the Decolor LA120 printed output provides the equivalent color "picture" directly from the auxiliary RS-232C port. The Decolor PI-125 prints 14 different colors with up to four densities when used with an upgraded LA120 printer, the vendor said.

The Decolor PI-125 costs $495, the vendor said from 8 Blanchard Road, Burlington, Mass. 01803.

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Cartridge Disk Drive Fits Compat/123 Processor

HUNTSVILLE, Ala. — General Digital Industries, Inc. has announced the Iomega Alpha-10, a 10M-byte removable cartridge disk drive for the firm's Compat/123 processor. The Compat/123 is based on a Digital Equipment Corp. LSI-11/23 processor.

The Iomega Alpha-10 offers hard disk capacity plus the convenience of a removable cartridge. The unit offers a 35M/sec average access time and a 896K-byte transfer rate, the vendor said.

The Iomega Alpha-10 costs $4,000, the vendor said from 7702 Governors Drive, Huntsville, Ala. 35805.

ECA Feature Repositions BT-1500 Printer Columns

MALDEN, Mass. — An electronic character alignment (ECA) feature that reportedly eliminates the need for a flight timing service call is available on the BT-1500 Band Printer from Data Printer Corp.

When a column of printing becomes displaced in a line printer due to high usage, the end user can reposition it with the help of the ECA, the vendor said. This feature is only available on the vendor's BT-1500 Bandtrain printer, which costs under $20,000. The ECA option is available separately for approximately $1,100.

Data Printer Corp. is at 99 Middlesex St., Malden, Mass. 02148.

Winnie Upgrade Program Targets Memorex Model 601

CANOGA PARK, Calif. — Datamemory Corp. announced what it calls the industry's first independent upgrade program for a Winchester disk drive by taking the discontinued Memorex Model 601 drive and upgrading the capacity from either 24M-, 50M- or 75M bytes to over 125M bytes.

Capable of storing up to 125M bytes of unformatted data, the drives are reportedly hardware compatible with the systems into which they are installed. The upgrade costs $3,000 from the vendor at 6750 Eton Ave., Canoga Park, Calif. 91303.

Carry-In Repair Option Announced by North Star

SAN LEANDRO, Calif. — A carry-in repair option for service on systems and peripherals has been introduced by North Star Computers, Inc. The company announced the carry-in option as a lower cost, more convenient alternative to the standard on-site service offered since last year. The option allows users to either carry in or send their nonwarranty repairs to 13 depot sites located in the U.S. The sites are generally within overnight United Parcel Service shipping distance of any user, the vendor said.

Two types of payment plans are included as part of the new repair service. An annual depot service agreement is available that covers any necessary repairs including shipping costs back to the customer. Customers who don't want to purchase a service agreement can contact the depot nearest them to receive a return authorization when they run into a specific repair problem. The charge for this type of repair is a flat rate based on the required repair, a spokesman said.

The cost of the carry-in service for a standard dual floppy North Star Advantage would be $306/year. Comparably, the on-site repair would be $36/mo. Additional information may be obtained from the vendor at 14440 Catalina St., San Leandro, Calif. 94577.

Bits & Pieces

Interface Card Ties MT 160 Printer to Apple II

SEATTLE — Mannesmann Tally, Inc. has announced an interface card that allows the firm's MT 160, a multifunction matrix printer, to be used with Apple Computers, Inc.'s Apple II microcomputers.

The printer is an 80-col. serial matrix printer capable of three-way paper handling with an optional tractor drive attachment and paper roll holder. The interface card is a single printed circuit board. The board is installed in the Apple II processor, and a cable connects to the printer.

The interface card costs $149 and the MT 160 costs $990, the vendor said from 215 Eighth Ave. N., Seattle, Wash. 98109.

BTI Mark II Version Of 5000 Mini Out

SUNNYVALE, Calif. — BTI Computer Systems has unveiled a Mark II version of its 5000 16-bit multiuser minicomputer, which BTI said is 50% faster than its current models.

BTI is also offering a field-installable Mark II Upgrade Kit.

The Mark II costs $38,950, the Upgrade Kit costs $5,000, from the vendor at 870 W. Maude Ave., Sunnyvale, Calif. 94086.

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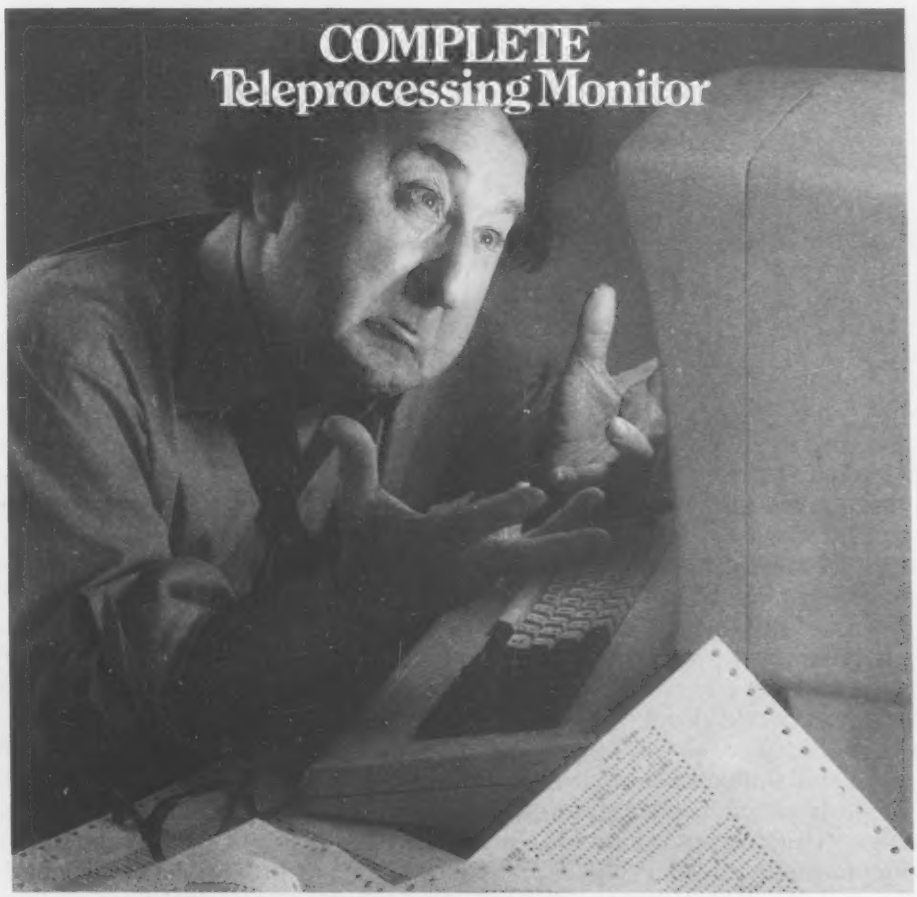

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No single universal standard has emerged. Nor is one likely to. There are simply too many diverse networking environments, each fulfilling specific, mutually exclusive needs.

That's why Digital is committed to supporting and, in fact, actively promoting the more important standards now surfacing in the various environments.

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When we first developed our networking architecture, we understood the need for flexibility. We consciously adopted an architectural strategy that would allow our networking software to work freely with a wide range of protocols, including some that didn't even exist at the time.

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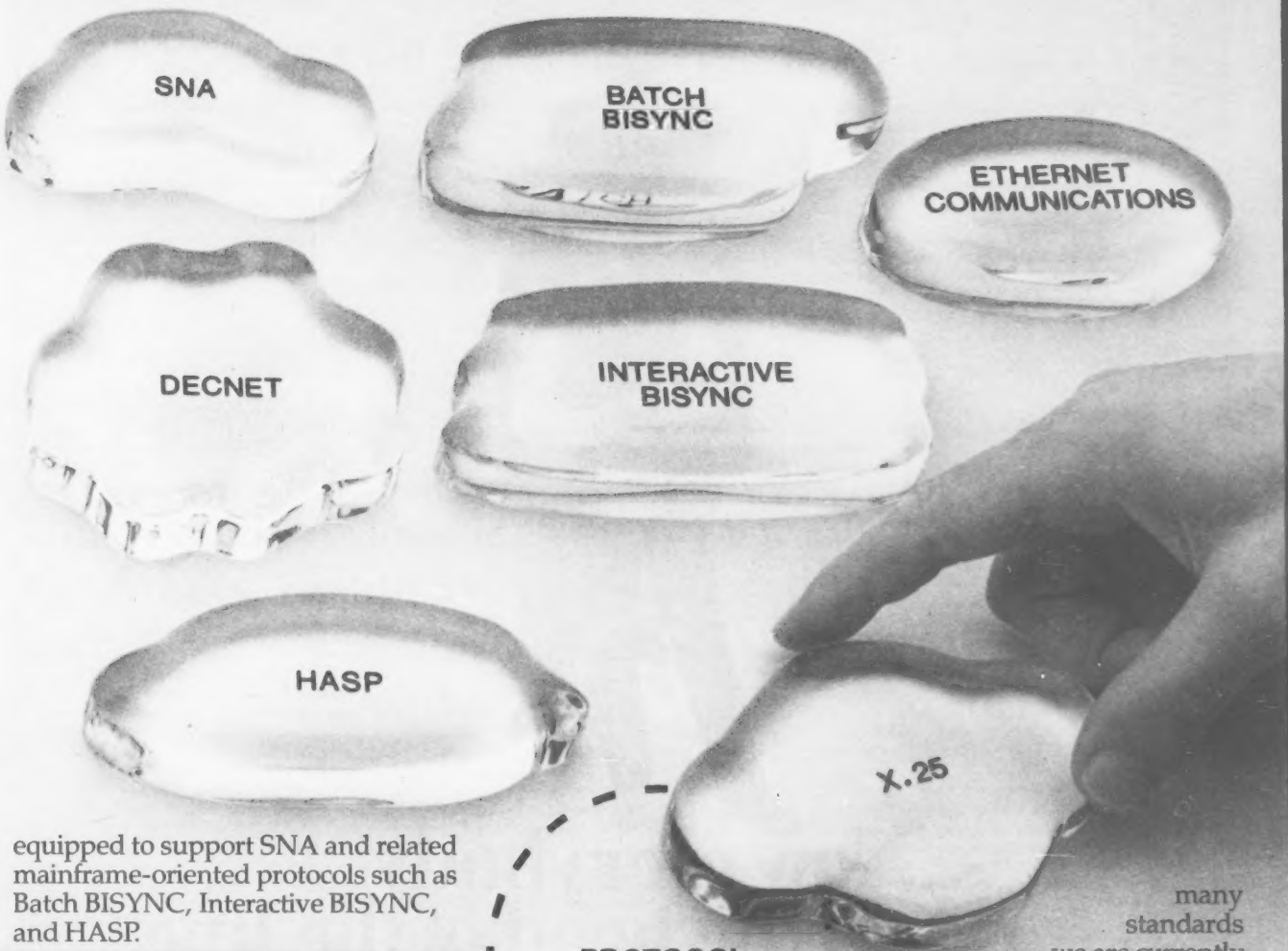

equipped to support SNA and related mainframe-oriented protocols such as Batch BISYNC, Interactive BISYNC, and HASP.

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Some High Marks, Some Questions

OA Experts File Mixed Reviews for Lisa

By Jim Bartimo
CW Staff

Office automation experts have given mixed reviews to Lisa, Apple Computer, Inc.'s recently released 16-bit microcomputer. The low cost and advanced engineering have received the highest marks while some still question its raison d'etre.

"I think it's a major technological feat to offer what they're offering for $10,000," said Patricia Seybold, of the Seybold Consulting Group in Boston. "I see it fitting into the high end of the market."

Seybold said Lisa is likely to be used by "professionals who do a lot of financial analysis and need report and graphics output" or by a manager of a project team.

Apple said one of Lisa's strongest points is its ability to integrate spreadsheet, word processing, graphics and data base capabilities. "I see it as the first of a generation of products that integrates capabilities," Seybold said, but warned, "I don't know if the market is ready for it right now."

Michael Hammer of Hammer and Company, Inc. in Cambridge, Mass., praised the quality of the hardware and software, but sees the function integration as a clouding of the machine's purpose. Although he has not yet studied the machine closely, Hammer was still skeptical.

'. . . its a major technological feat . . .' but, '. . . I don't know if the market is ready for it now.'

"It's approach is too general," Hammer said. "What's needed is a personal [decision support system] capability and Lisa doesn't have it. [The Lotus Development Corp. integrated software package for the IBM Personal Computer,] 1-2-3, is more specific . . . the user interface is very nice."

Calling other workstations such as the Xerox Corp. Star and the Grid Systems Corp. Compass "one-day wonders," Hammer wondered if the Lisa might be another flash in the pan. According to him, when users bought the Star and Grid systems they said, "it's real nice, but what are we going to do with it?"

An ideal system, Hammer pointed out, would be one that is integrated with the departmental and corporate levels of information processing. "I think Apple is going to have a hard time making it in large corporations," he said. "Apple doesn't have the image and experience with this group."

But another office automation consultant said that Lisa will "give Apple more of a presence," in a corporate environment because it is more of a business product. "When the Apple II came out — it was a quality product and it looks like they've done it again," said Thomas A. Hannagan of Hannagan & Associates, Inc., Schaumburg, Ill.

Comparing it to the Star workstation, Hannagan called Lisa a better product. "The Apple is clearly advanced in its ease of use and clear presentation," he said, "From the workstation standpoint, it's what eveybody's been waiting for — a Star at half the price."

Seybold also said that Lisa compares favorably with the Star, but criticized Lisa's slow response time and questioned some of the vendor's claims to ease of use. While the Apple claimed users can become proficient in half an hour, Seybold said the concepts may take as much as a day to learn.

But Seybold pointed out that even with these faults, Lisa may keep Apple on the corporate map. "There are a lot of companies who might have closed the door on Apple and standardized on IBM," she said, "if it weren't for Lisa."

Unix-Based Workstation Boasts Continuity, Ease of Switching

PACHECO, Calif. — Century Analysis, Inc. has unveiled a multiuser, Unix-based intelligent workstation with bundled software that reportedly provides continuity between facilities and ease of switching between functions.

Officeware uses an intelligent workstation based on two 16-bit Intel Corp. microprocessors. The 8086 contains 256K bytes of random-access memory and is used for applications. The 8088 contains 128K bytes of memory and is used for display purposes.

The workstation features an 80/132 col., 14-in., 820 by 600 pixel green phosphor CRT with fully tilting and rotating screen. The detachable keyboard has 105 keys.

The workstation may be linked to a Unix-based host and other Officeware workstations in a local-area network or to a mainframe-based local-area network. It also runs under operating systems from Digital Equipment Corp., Prime Computer, Inc. and Ryan McFarland Corp. It has no local storage.

The bundled software packages include:

- Officeware Script, a general writing instrument providing text, word and general information processing.
- Officeware Plan, a spreadsheet package with formula management, report consolidation and data manipulation.
- Officeware Forms, a methodology for providing list management, user-defined formats and protected/unprotected fields.
- Officeware Terminal, which provides emulation of Applied Digital Data Systems, Inc. Regent series, Televideo Systems, Inc. 950 and NCR Corp. 7900 series CRT terminals.
- Officeware Desk, with such personal utility functions as reminders, phone lists and calendars.
- Officeware Network, an electronic mail package featuring user-to-user facilities such as mail, network directories and telephone messages.

The mainframe host interface software serves as the link between the Officeware interface and support facilities and a specific operating environment. It costs $4,250/terminal unit.

The intelligent terminal and bundled software costs $3,500 from Century Analysis at 114 Center Ave., Pacheco, Calif. 94553.

DG Minis Get WP, Printing Aids

SAN FRANCISCO — Micro-Systems International Corp. has unveiled a multiuser microcomputer system with a distributed processing operating system. The operating system reportedly gives each user access to a dedicated processor and manages common resources like disk files and printers.

The Multi-Net system is compatible with Digital Research, Inc.'s CP/M operating system and features both a Zilog, Inc. Z80 eight-bit chip and an Intel Corp. 8086 16-bit microprocessor. Together, the two microprocessors can support up to eight concurrent users, according to a vendor spokesman.

As many as 16 of the machines, for a total of 150 users, can be tied together to form local networks that allow users to share both programs and data, the vendor claimed.

The Multi-Net system is packaged with a 1.2M-byte, 8-in. floppy diskette unit, a 20M-byte Winchester hard disk module and a 13.4M-byte cartridge tape system for backup.

A basic two-user system with a 64K-byte master processor, two user processors and a one-year warranty costs $9,995 from Micro-Systems at 12 Mercer Road, Natick, Mass. 01760.

Multiuser Micro Fits CP/M

PALATINE, Ill. — Compac Systems, Inc. has introduced word processing and printing software packages designed to run on Data General Corp. Nova and Eclipse minicomputers.

The 3 * 16 multiuser word processing package is said to offer password protections, global search and replace, instant top and bottom, underline, bold face, line centering, automatic word-wrap, stored phrases and mailing list merge functions.

The Remote Active Printer (RAP) is a spooler and remote slave printer control software package available for users of DG Business Basic, available from the vendor. It allows the user to implement the optional slave printer port on DG and compatible terminals.

The word processing package is available for $1,150; RAP for $349 from Compac Systems, Inc., 59 E. Cunningham Drive, Palatine, Ill. 60067.

WP Package Available for Apple II

HARRISON, N.Y. — Beaman Porter, Inc. has introduced a word processing package for the Apple Computer, Inc. Apple II. Among the package's features are automatic indents and automatic script formatting.

The Powertext package includes a 10-lesson tutorial in addition to a reference manual. Other features include a disk-based editor, user-definable function keys and word-by-word cursor movement.

The package is available for $299. A version that includes uppercase and lowercase and shift key capabilites is available for $329.95. A version for the IBM Personal Computer is available for $399 from Beaman Porter, Inc., Pleasant Ridge Road, Harrison, N.Y. 10528.

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Ex-Intel Employees Join Forces To Form Firm

By Robert Batt
CW West Coast Bureau

PORTLAND, Ore — Seventeen Intel Corp. employees, who resigned en masse from the semiconductor manufacturer last month, have formed a computer company of their own and are seeking venture capital.

The Gang of 17, led by Casey Powell, former general manager of Intel's microprocessor operation and president of the new company, and Larry Wade, a former manager in research and development, are currently developing a business plan to present to potential investors. The company has yet to be given a name.

(Continued on Page 84)

Difficulties Ironed Out On 5860: Amdahl Execs

By Robert Batt
CW West Coast Bureau

SUNNYVALE, Calif. — Performance problems on Amdahl Corp.'s 5860 processor have been ironed out and volume shipments are underway with over 180 machines due to be shipped this year.

This was the message delivered to a group of financial analysts and trade journalists here recently as Amdahl executives sought to deflate speculation that it was in trouble on its latest 580 series mainframe.

"The performance difficulties on the 580 series are behind us, the necessary engineering changes have been incorporated and the enhanced machines will be shipped to customers within the next two to three months," said Wayne McIntyre, director of product marketing at Amdahl.

To date 18 processors in the 580 series have been installed. These will also receive the performance enhancements, McIntyre added. Reportedly, it was delays caused by problems in meeting performance benchmarks that confined shipments of the new processor in 1982.

McIntyre said that the design problems that needed to be addressed were supervisor state performance programs that keep track of jobs currently in the processor and which monitor peripheral devices and transactions coming in from terminals.

"The instructor we worked on in the 580 was the instructor that does these tasks. Machine performance will be raised between one-quarter and one-third as a result of the design changes," he claimed. So far the design changes have only been tested in-house and have yet to be incorporated in any customer installation.

McIntyre explained that the problem was not that the instructors didn't work

(Continued on Page 80)

Beats Out Burroughs

Sperry Wins $476.2 Million Pact

WASHINGTON, D.C. — Sperry Corp. has defeated Burroughs Corp. in a two-year procurement contest for a $476.2 million Air Force computer upgrade contract, considered the largest commercial DP contract ever awarded.

Having prevailed in a 26-month "compute-off" competition, during which the two firms pitted their systems against each other at several military sites, Sperry will begin delivery in May of 153 1100/60 systems to more than 100 Air Force bases around the world. The systems will replace 20-year-old Sperry and Burroughs systems used for administrative support.

The Air Force spent $98.4 million to conduct the unusual competition, but Russel D. Hale, assistant Air Force secretary for financial management, estimated the government saved more than $335 million by making the two companies prove the worth of their systems before the contract was awarded. Sperry teamed with Computer Sciences Corp. to convert more than 1.5 million lines of software to develop its system for the "Phase IV" contract. Burroughs used Planning Research Corp. (PRC) for systems and software support for its entry.

Although both companies showed they could do the job, the award to Sperry was based "predominantly" on the firm's price, according to Hale, who said the winning bid was more than $60 million below the Burroughs figure. Joseph J.

(Continued on Page 84)

Integrated Planning Staff Busy With Stratagem Conversion

By Lois Paul
CW Staff

BOSTON — Conversion weighs heavily on the minds of the 14-member staff at Integrated Planning, Inc. here these days.

The developers of the Stratagem decision support system (DSS) for IBM mainframes have a number of changes in the works, evident immediately by the flurry of activity at a bank of terminals in its offices in Boston's Back Bay area.

The technical development staff, led by vice-president and co-founder Mark Gelfand, is in the process of converting the source language for Stratagem from AED to reentrant C. This is targeted for completion by fall of 1983. The plan is to make Stratagem available to the IBM mainframe market, as well as to users of any system with a C compiler and a Bell Laboratories Unix operating system. This may be via a hardware/software combination or as a stand-alone software package. It opens the door to the 32-bit desktop market, including Apple Computer, Inc.'s recently announced Lisa, according to Bennett Da-

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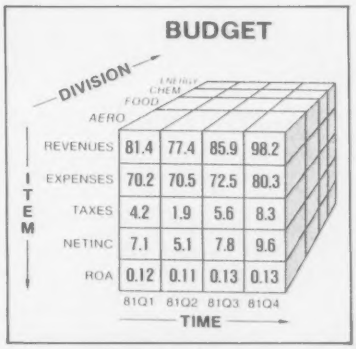

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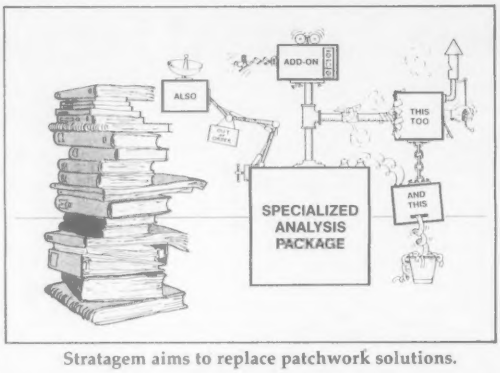
Conversion in the Works for Stratagem Creators

(Continued from Page 77)

vies, vice-president of marketing.

The software is not the only thing on the threshhold of change at Integrated Planning. Currently housed in a suite of unconnected, crowded offices, the staff is preparing for a move to more comfortable quarters in downtown Boston. The sense one gets is that the firm is still one of the smaller new faces in the DSS market, but is gearing up for substantial growth within the next few years. The staff expects sales to double in 1983.

Davies explained that the move to C and Unix is a response to the trend for more processing at the local level. "We want to deliver Stratagem at a level where hardware is reasonable in price, yet processing capability is sufficient to do modeling." According to Gelfand, the conversion also will make Stratagem faster and able to handle efficiently more simultaneous users.



Stratagem aims to replace patchwork solutions.

Unlike some of the firm's competitors, who are offering versions of their products for the 16-bit marketplace, Integrated Planning will not go this route. "We are bringing an identical version of the product to the small machine," Gelfand explained. "I am not sure if we could, or would even want to, start performing surgery on Stratagem to get it running on the existing IBM Personal Computer. If it comes up to [Motorola, Inc.'s] 68000 size, maybe."

Birgul Erengil, president and co-founder of Integrated Planning, explained that the firm currently is looking for a 32-bit machine on which to begin testing Stratagem. She said they are looking also toward instituting a new time-sharing pricing scheme for Stratagem this spring. "We are planning to make available a fixed-cost per user ID basis — say $3,000 a month and all you can do on a user ID."

Stratagem, which runs on IBM and plug-compatible mainframes under VM/CMS or MVS with TSO, has been marketed for about a year. There are 15 users to date, half of which are running the product on in-house systems.

Stratagem was deliberately designed not to be a modularized system. The developers of the product saw that successful packages evolved during the 1970s to handle data management and query, financial modeling and statistical analysis. "We just thought that the way to do it is not to kludge on module after module over a period of five or seven years," Davies said. "This would present lots of drawbacks in terms of ease of use and computer efficiency. Instead, we decided to wipe the slate clean and come up with a grandiose design and put those capabilities in one system."

"Stratagem as a tape on a computer is not a decision support product," Davies said, adding that it only becomes a DSS in the context of having some important information with which to link it and some objectives in terms of providing a level of analysis.

Graphics Market Growth Seen Fueling Sales to $17 Billion by '87

SAN JOSE, Calif. — "Explosive growth" in the computer graphics market will fuel sales to a compound annual rate of 41.6%, topping $17 billion by 1987, according to a market analysis report from Creative Strategies International, Inc. (CSI), a market research and consulting firm. However, CSI noted that the current 4% Japanese share of the U.S. market could increase to 30% by 1987 and, possibly, to 80% by 1990.

More diverse applications and new market niches are also predicted as competition moves rapidly toward a strong focus on applications rather than technology. Primary market trends are toward raster technology, color, applications software, 32-bit technology and quality hard copy.

Computer Graphics indicated that computer-aided design and manufacturing (CAD/CAM) will be the fastest growing application and that a new low-end CAD/CAM market "holds great promise in the '80s." Raster technology is expected to continue gaining over other display technologies. The raster nonimaging processing displays/systems segment will see the sharpest growth, with sales increasing at a compound annual rate of over 60% through 1987.

The report examined the market for hard-copy devices and turnkey systems houses, changing industry structures and competitive environment by market sector. Company profiles and market-share data are included.

Computer Graphics is available for $1,450 from CSI at 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

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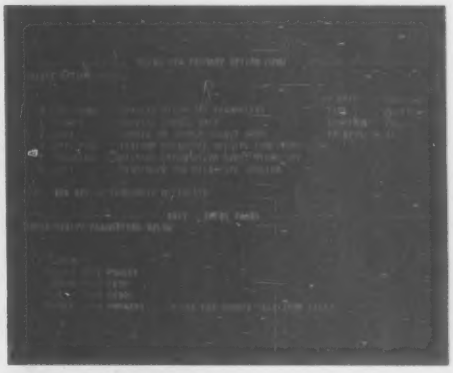

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Protectionist Sentiment Likely on Capitol Hill

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The growing protectionist sentiment on Capitol Hill, which was barely kept in check last year, is likely to reappear with added vigor at the recently convened 98th Congress, observers feel.

But while it may seem more likely that the U.S. will initiate some sort of trade action to reduce its mounting trade deficits, particularly with Japan, it is not a foregone conclusion. And most electronics industry observers said, publicly at least, that it would be in the best interests of all concerned if some way can be found to ensure fair trade between the two industrialized powers.

Analysis

The Semiconductor Industry Association (SIA), which has been at the forefront of lobbying efforts aimed at raising fair trade issues in Washington, is giving what may be one last try to ease purported trade differences with Japan. The growing interdependence of the electronics industries in the two countries makes some civil accommodation very important, according to Warren Davis, SIA director of government affairs.

"This is a global industry, and it's becoming more global all the time. As we go through this process, millions of dollars are being invested in Japan for

(Continued on Page 86)

Execs: 5860 Problems Ironed Out

(Continued from Page 77)

but they did not go fast enough. "It was not a question of us being surprised because we had forgot something. It was simply a question of making those instruction sets more efficient. As far as essential functions are concerned, nothing has changed," he told his audience.

Company officials admitted that the introduction of IBM's MVS/SP Version 2 Release 1 and data management facilities — the so-called MVS/XA software product — could cause Amdahl to add more instructions to its 580 series.

"We have a project team working on implementing XA on our machines, although we believe the 580 already has the necessary capabilities, but we could be surprised. However, based on what we anticipate the XA is going to be, there are no show stoppers to implementing XA on both the 580 and 470 line of processors," asserted Kenneth Simonds, executive vice-president.

Supply Problem

The company said it expects demand for the 580 to come from many different industry sectors. "Our greatest problem with the 580 in 1983 will be a supply problem, and customer waiting time will be around four to five months," Simonds warned. Production of the system is expected to reach its peak in the second half of this year. Of the 18 systems so far installed, 50% are hooked up to IBM 3380 disk systems, and 80% run under the MVS operating system.

In reply to a question about processor power, McIntyre said that a 40 million instructions per second (Mips) processor was feasible during this decade based on the wide variety of technologies currently available. However, as far as competition from IBM is concerned, he asserted its thermo conduction module (TCM) package is not good enough to achieve that capacity. "We expect TCM to be capable of dealing with 25 to 30 Mips at maximum," McIntyre added.

There has been some speculation among industry analysts that using its current air-cooled systems, Amdahl would not have the technology to compete with a 40 Mips machine.

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Larry R. Harris

As Info Center 'Supervisor'

AIC Exec Envisions Intellect's Role

By Jenny Charlesworth
CW Staff

WALTHAM, Mass. — The developer of one of the first commercial implementations of artificial intelligence technology claims to have found a new niche for its product in the growing number of information centers.

Larry R. Harris, president of Artificial Intelligence Corp. (AIC) and co-developer of Intellect, a natural language query system, explained in a recent interview that he envisions Intellect as a "supervisor" of the information center. Intellect, he said, will drive the other end-user-oriented tools.

"No one buys the system because it is an artificial intelligence system. They buy it because it lets them access their system," Harris said.

This new emphasis on the use of Intellect as an end-user interface to other information center tools is coincident with the company's recent unveiling of an enhanced version of the Intellect Series 200 [CW, Jan. 10].

In an information center environment, there may be several different end-user-oriented tools and, thus, users have to learn several different languages to make use of these offerings. Using Intellect as a front end to the other tools will eliminate this problem, Harris claimed.

"To make real use of the tools, you would want to use them together. Instead of taking data from the data base, running to the modeling system, then to the graphics system, Intellect 200 can accomplish all these tasks," he continued. "A user can come to the information center through Intellect. Effectively, it will be driving the data base system and also taking responsibility for the communications."

Harris noted that because Intellect's first implementation was as a query language interface for a data base management system, people tend to see the product only in this role.

"Basically," Harris said, "Intellect is not a data base query system. It is a natural language understanding system. It can also be used as the front end of a decision support system, graphics and so forth."

Another reason the product is suited for information center users, Harris said, is its handling of ambiguities. For a nontechnical person, the probability of his being misinformed by Intellect as opposed to using a formal system is much, much less, he said. For example, if Intellect sees a word that it has never seen before, it isolates it to give the user a chance to change it or define it.

"The burden is on the system to understand you rather than on the user to understand the system," Harris concluded.

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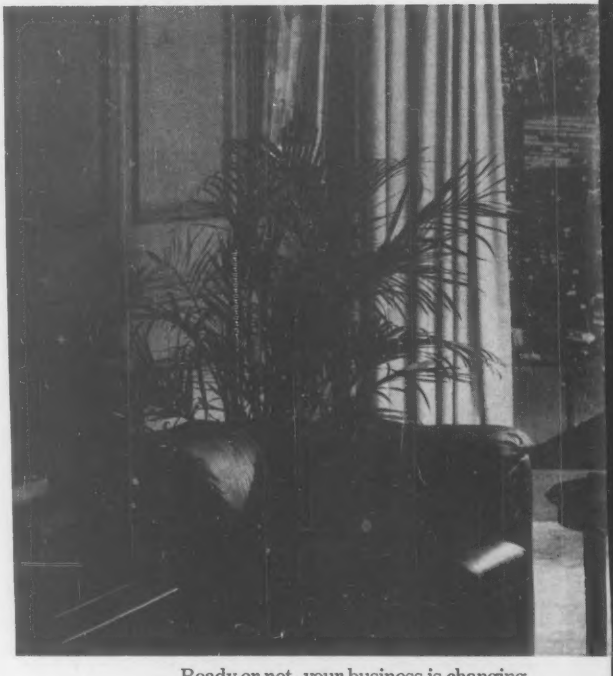

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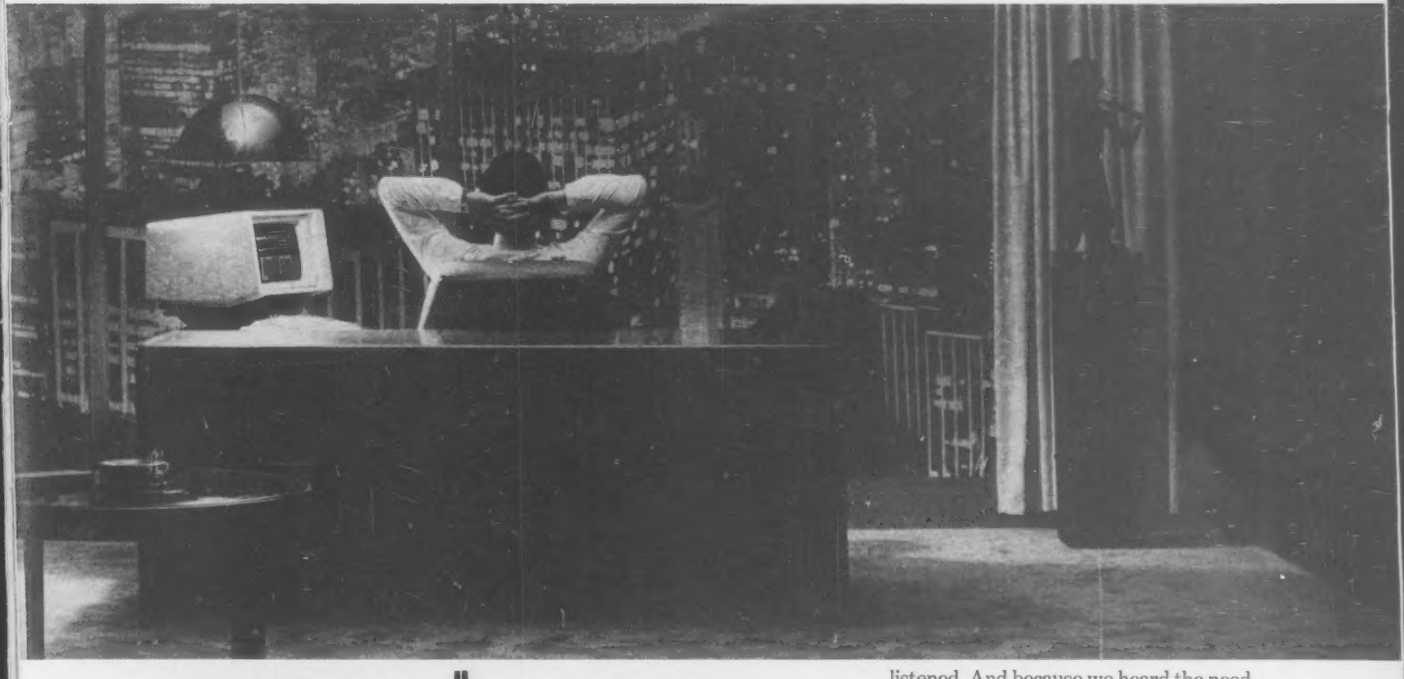

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Ex-Intel Employees Join Forces to Form Firm

(Continued from Page 77)

The mass resignation, the largest defection in Intel's history, will, according to company officials, pose no serious threat to the chip manufacturer's on-going work. An Intel spokesman asserted: "In the long term, the resignations will have no strategic impact on the company and will not deter our strategic direction. Individual projects will be hurt over the short term and some key people will need to be replaced."

This assessment was shared by Wade, who argued that since the people who resigned came from several different groups, the impact on any one Intel project should be small. The resignations came from three major OEM areas within the company's plant at Aloha, Ore. — systems, module and strategic systems operations.

Industry sources speculated that the 17, who include former Intel specialists in hardware and software engineering, marketing and line management, were carefully chosen to avoid the kind of lawsuit filed against former Intel employees when they left to form a new company, Seeq Technology, Inc., in January 1981. The suit, which involved trade secrets relating to memory chip technology, was settled out of court.

'It was simply a case of the great American dream, to go off and form our own company.'

Wade, vice-president of the new venture, explained: "We have not yet created a business plan since we wanted to leave Intel before doing that. All we can say at this time is that we have lots of ideas and we haven't yet decided which ones to pursue."

He denied that a wage and salary freeze imposed late last year at Intel had prompted the mass resignations and described the relationship between Intel and the ex-employees as "cordial."

"Salary did not influence our decision to leave in any way," Wade said. "It was simply a case of the great American dream, to go off and form our own company."

Sperry Defeats Burroughs For $476.2 Million Pact

(Continued from Page 77)

Kroger, president of Sperry's Computer Systems Division, said the contract will mean approximately 2,000 new jobs for the firm, some of which may be filled by members of the losing Burroughs-PRC team, he said.

"Obviously I discounted to get this bid," Kroger said at a Jan. 31 Pentagon press briefing on the contract. The contract runs for eight years with two six-year options, which if they both also go to Sperry could bring the contract's final income to the company to well over a billion dollars, according to one estimate. Kroger called the compute-off "a tough competition" and remarked that the award to Sperry creates "a difficult situation for [Burroughs Chairman Michael] Blumenthal and Burroughs.

More than 100 firms were asked to respond to the original contract proposal, issued in December, 1978, but Burroughs and Sperry were the only two firms willing to devote their resources to the 26-month compute-off.

Political Changes

Several other firms objected to the way the proposal was structured and the House of Representatives Government Operations Committee insisted on several major changes to the contract plan.

The committee is satisfied with the way the competition was structured but wants to make sure the compute-off was properly handled, the aide said.

The first Sperry system is slated for installation at Langley Air Force base in Virginia this spring, with the rest to be delivered during a 29-month period. Hale said that at 20 to 29 bases the Air Force will install dual systems, with one of each pair housed in a mobile, "tactical shelter" for survival purposes.

In addition, the Air Force plans to establish 14 regional systems for distributed data processing support of its bases under the new contract. The world wide Sperry system will include more than 7,000 terminals linked to the 1100/60 mainframes via $20 million worth of telecommunications facilities, the government said.

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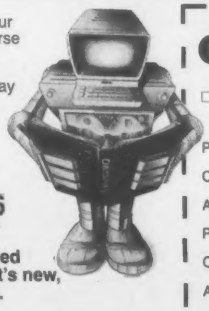

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A

Marketing Seen More Decisive Than Technology

By Robert Batt
CW West Coast Bureau

PALO ALTO, Calif. — The most successful computer manufacturers in the 1980s will be those having superior marketing organizations rather than technological advantages, a number of management consultants and industry analysts have claimed.

Dan Rubin, a management consultant at SRI International of Menlo Park, Calif., claimed that manufacturers driven by technological advantage are largely a thing of the past. Instead, he said, marketing expertise and software services will determine success in the user marketplace.

"The issue is no longer whether you can produce a better product than IBM, for example, because that's not what sells it these days," Rubin said.

"The major issue now is, can you give your customers the service they require, and the focus needs to be on promotion, distribution and packaging of the product in a way that meets those requirements. Users are less willing to put up with problems than they were because they can get a good machine from another vendor if they need to."

Winners and Losers

According to Cliff Higgerson, director of research at financial analyst Hambrecht and Quist, it is the marketing and service a manufacturer provides that will separate the winners from companies that do not survive in the long run.

"Customers are not going to buy a product just because it is a better mousetrap, it has to provide value to the user in solving problems. What is important to users is reliability, lower costs and back-up services, and so just because a company has a better technological product than its competitors is no guarantee of success," he said.

Many analysts had picked Sperry Univac in the late 1950s and early 1960s as the company that would lead the mainframe charge in the future. It was assumed that Univac had superior technology to that offered by IBM and would thus emerge as the market leader.

History proved the analysts wrong, however, as IBM assembled a marketing machine second to none, and today it is several times larger than Univac or any other of its competitors.

Frank Petro, vice-president of information technology at management consultant Arthur D. Little, Inc., said the ability of vendors to communicate effectively with top-level end-user managers will determine whether they are successful or not.

"The prosperous manufacturers in this decade will be those companies whose orientation and culture is focused on solving business problems rather than the strength of the technology itself," he said.

"Some companies are better prepared to communicate with decision makers than others. You need sales people who can communicate with top-flight executives, and that requires people of high managerial caliber rather than someone who can only talk about how the machine works," he added.

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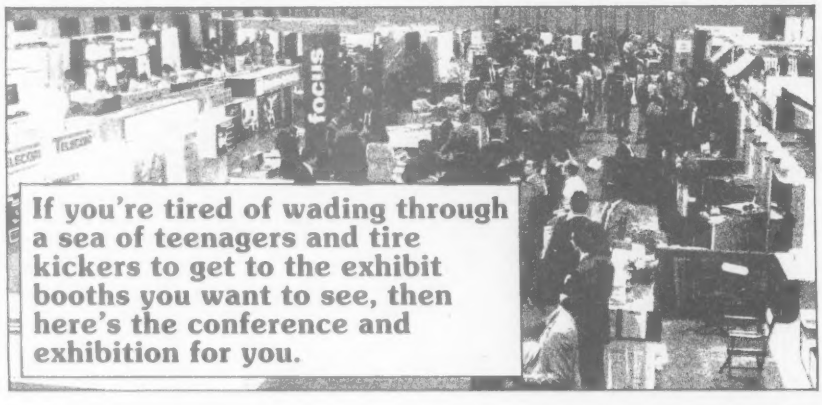

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Put EMCE™ on your calendar now! The Sheraton Centre in New York City is the place; Thursday, June 23 - Saturday, June 25, 1983 are the dates. Complete conferences will be held Thursday and Friday with a special shorter session to be held on Saturday. Exposition hours: 11-7, Thursday and Friday; 10-6, Saturday. Watch this space for complete details on program and attendance.

If you're interested in exhibiting at EMCE™ contact Doris Rosner, Mitch Hall Associates, 1200 East Street, Westwood, MA 02090 (617) 329-8334.

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Protectionism Returning to Hill

(Continued from Page 80)

subsidiaries of American companies," Davis said, noting the multimillion dollar new plant investments in Japan of IBM, Motorola, Inc. and other U.S.-based manufacturers.

"By the same token," he continued, "[Japanese] plants are coming up here — [NEC Information Systems, Inc.] in Roseville, [Calif], in Dallas for Hitachi, and San Diego for Fujitsu, and Silicon Valley for Toshiba and others. The two countries are becoming much more interdependent because of these investments as times goes on."

Davis added that there are other global reasons for settling trade disputes amicably. "All the rest of the world, be it Mexico, South Korea or France, . . . is looking to see in high technology what the U.S. and Japan do, and whatever we do it's going to be emulated around the world . . . The stakes are far higher than the U.S.' and Japan's particular quarrel with one another in high technology."

The electronics industry has long been an advocate of free trade, not only because U.S. companies rely so heavily on revenues from abroad, but also because no healthy company likes to see government interference in its marketplace, either at home or abroad.

Lloyd Kaufman, director of trade for the Computer and Business Equipment Manufacturers Association, remarked that the idea of the federal government's setting an industrial policy for the DP/telecommunications industry "bothers the hell out of us."

And just as the U.S. electronics industry fears government interference, it knows federal intervention aimed at promoting reciprocal trade agreements could speed regulation of the industry abroad.

STRATUS VS. TANDEM

(Or how the hardware fault tolerant solution supersedes the software based solution.)

"If you drive down the cost of physical hardware, you can make typically redundant paths for less money. Not surprisingly, most redundancy breakthroughs that will occur happen in hardware rather than in software.

You can build a double computer inside one box for less dollars, as opposed to doing it in software, which continually needs maintenance and revision, as well as improvement."

by Aaron Goldberg
of IDC which
appeared in *Computerworld's*
December 28, 1981 issue.

STRATUS/32 – SYSTEM HIGHLIGHTS

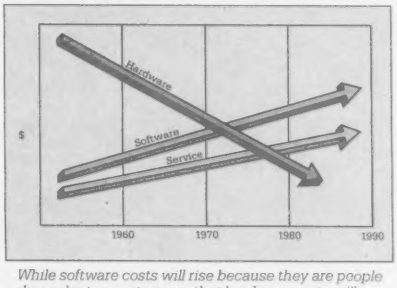
1. A simple hardware solution to fault tolerance that totally eliminates the need for extra application design and additional programming.
2. A design without performance penalties for fault tolerant operation – NO CHECKPOINTING!
3. A computer that pinpoints and isolates its failures, so repair is made quickly and inexpensively.
4. A system that can expand to 32 Fault Tolerant Processing Modules under a "single system image."

Now that the computer age is in full stride, 100% availability is fast changing from a luxury to a necessity. Downtime and its costs are unacceptable, especially when there is an alternative. Now that fault tolerant operation is becoming a universal requirement, there is demand for an improvement over the software approach used by Tandem. These computers must provide better performance, be easier to use, be easier to program and re-program, be less complicated and less expensive. We believe that the Stratus hardware based fault tolerant system answers these demands. Let us explain.

Why more hardware is better than more software.

The crux of the problem with software based systems is that they require complex, performance stealing software to provide fault tolerant operation. This software robs the system of precious resources because it uses processing cycles to pass status and checkpoint information back and forth between two computers. What's more, this passing of information can occur at four levels: operating system, user program, file management, and terminal control.

Stratus, meanwhile, has eliminated all this reliability software by having duplicate hardware components tightly coupled, dedicated to performing the same tasks at the same time. It's like having two computers in one, rather than two separate computers. Checking hardware logic detects errors with no performance loss and stops failing components instantly. The duplicate partner continues without interruption, unaffected by the failure. This is all transparent to the programmer and the user. With Stratus, there is no performance or data loss when there is a failure, no operator intervention, and no special programming.



While software costs will rise because they are people dependent, experts agree that hardware costs will continue to fall.

Why Stratus is easier to implement.

The Stratus designer and programmer might as well be dealing with a conventional computer; one of them, not two.

Programmers are in a familiar environment. By providing industry standard languages, applications can be moved over without redesign or major reprogramming. Fault tolerant operation is a bonus, not a complex effort.

Since there is no checkpointing with the Stratus hardware based solution, the applications designer and programmer is never concerned about overhead for fault tolerant operation. They view the system as a single computer; unconcerned that there are two computers running together.

$140,000 – Software included.

The Stratus concept could not have been executed 10 years ago, 5 years ago, or even 2 years ago. It is possible now because of the dramatic price drop of hardware components. Because of this lower cost of hardware, and because of the simplicity of its architecture, Stratus can offer Continuous Processing™ at a price competitive with traditional systems that don't offer this capability. A fully duplexed configuration with 4 megabytes of memory, peripherals, and software can be purchased for under $140,000.

Don't overlook our software.

To complement our hardware approach to Continuous Processing we have an impressive list of software. For instance: Virtual Operating System (VOS), Transaction Processing System (TranPro), Data Management System, CRT oriented command language, Cobol, Basic, PL/I, Fortran, Pascal, Networking using X.25, IBM Communications, full screen editor, symbolic debugger, forms designer and a complete Word Processing package.

If your application requires total reliability, if you are considering any kind of dual-processor configuration or if you're considering Tandem, then you should fill out our coupon or call Nick Bologna, Director of Product Marketing, 617/653-1466.

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Executive Corner

• **Christopher J. Lynch** has been named president of Cosmos Systems, Inc. and elected to the board of directors.

• **Donald W. Van Buren** has been appointed president of Comdisco Maintenance Services, a subsidiary of Comdisco, Inc.

• **William F. Rigby** has been appointed president and chief executive officer of Point 4 Data Corp.

• **Basil A. Beneteau** has been appointed director and vice-chairman of Northern Telecom Ltd. He has been succeeded as president of Northern Telecom Canada, Ltd. by **David G. Vice**.

• **Robin A. Reyes** has been appointed president of Software International Corp., a subsidiary of General Electric Information Services Co.

• **Terry D. Carder**, president of Reynolds & Reynolds, Inc., has been named chief operating officer. Appointed group vice-presidents were **Lee C. Lewis**, business forms; **Arnold H. Cantrell**, computer systems; **Budd L. Tipple**, systems development and support; and **R.H. Grant III**, international.

• **Robert A. Holzinger** has been appointed executive vice-president, systems development; **Anthony J. Mangan**, vice-president, information processing; and **William J. Rikkers**, executive vice-president, administration, of Northwest Computer Devices, Inc., a unit of Northwest, Inc.

• **William P. Meehan**, former vice-president and treasurer of Motorola, Inc., has joined Datapoint Corp. as executive vice-president, finance, and chief financial officer.

• **Ronald L. McKee** has been appointed vice-president, technical services, for National Advanced Systems, Inc.

• **Gary W. Hedge** has been named corporate vice-president at Mini-Computer Business Applications, Inc.

• **Wolfgang H. Schwartz**, manager of Rolm International Telecommunications Division, has been named a vice-president of Rolm Corp.

• **Richard C. Perkinson** and **Stewart L. Stokes** have been named vice-presidents of Q.E.D. Information Sciences, Inc.

• **Lewis Wolfson** has been promoted to vice-president of the Business Systems Division of I-Concepts, Inc.

• **Robert H. Dugan** has been named to the newly created post of senior vice-president, financial services.

• **James A. Cote** has joined Tricom Systems Corp. as vice-president of sales and marketing.

• **Bart Davis** has been named vice-president of production for NLT Computer Services Corp.'s Direct Response Division.

• **Herb Espeland** has been appointed to the newly created post of vice-president of quality assurance and product support at Century Data Systems, a subsidiary of Xerox Corp.

• **Michael A. Koulopoulos** and **Julian Soshnick** have been elected vice-presidents of Analogic Corp.

• **Paul H. Bosse** has been named senior vice-president of finance and chief financial officer for System Industries, Inc.

• **Ernest J. Porcelli** has been named president and chief operating officer of Direct, Inc., succeeding Direct co-founder **John B. Darke** who has been named chairman of the board.

• **B. Carl Lee** has been appointed vice-president and chief financial officer at Beehive International.

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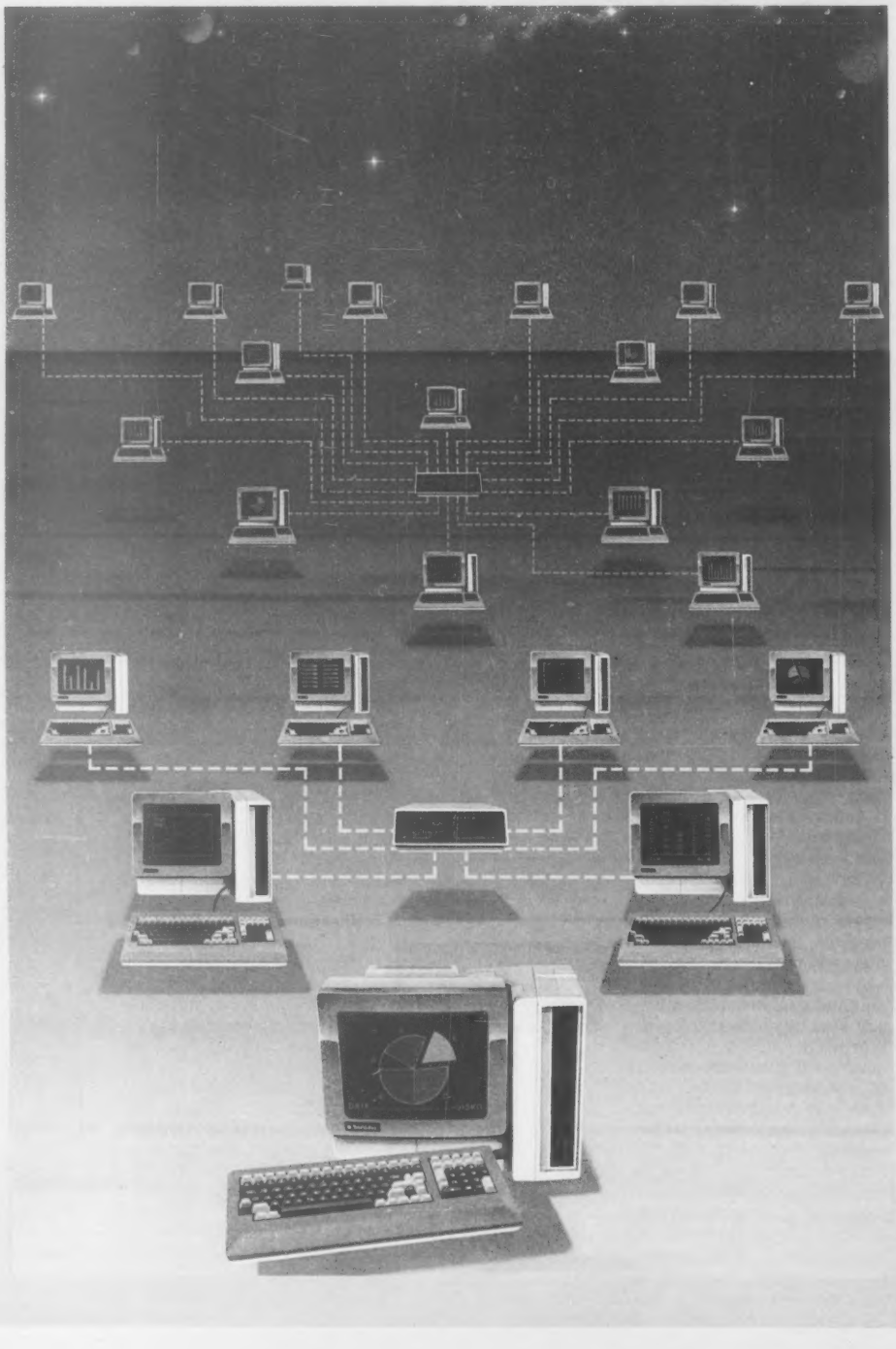

Despite Current Market Share of 4%

Japanese Dominance in Graphics Seen Coming

By Robert Batt
CW West Coast Bureau

SAN JOSE, Calif. — Japanese competition in the computer graphics industry, which up until now has been negligible, could explode into a position of dominance within the next few years, according to a recently published report.

Entitled "Computer Graphics," the report by Creative Strategies International claims the current Japanese graphics market share of about 4% could increase to 30% in three years and to 80% by the end of the decade.

The report also claimed the West has been lulled into a false sense of security by the relatively slow growth of the Japanese computer graphics industry to date.

"There is an assumption among domestic manufacturers," the report stated, "that the Japanese will not be able to come up with the software to support a really competitive graphics capability. Our research, however, shows they are well positioned to interface with the West to get the software they need. In addition, they are working on manufacturing their own software."

The report explained: "The turnkey segment [of the market] is the cornerstone of the computer graphics industry, providing complete systems as well as software and services.

"Nearly a quarter of all gross OEM revenues, however, are derived from an overlap of components revenues between OEM's and turnkeys. Continued overlap is expected to approximate 30% of future gross OEM revenues."

"Computer Graphics" is priced at $1,450 from Creative Strategies International, 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

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Packet Mart Examined

NORWALK, Conn. — The packet switching services market will head toward the $4 billion level in annual sales within 10 years, with AT&T taking an increasingly significant share of the market, according to a research study released by International Resource Development, Inc. (IRD) here.

The report, "Packet Switching — Public Services and Private Systems Market," also predicted that as many as five new suppliers of packet switching services may enter the market within the next two years. This continued rapid growth and vendor involvement is expected to lead to increasingly strong pricing competition.

The report examines the effects of pricing competition on GTE Telenet Communications Corp.'s Telenet and cites market factors and trends seen contributing to recent and future market growth. It also looks at the entry of IBM and AT&T into the packet-switched arena.

"Packet Switching — Public Services and Private Systems Market" costs $985 and is available from IRD at 30 High St., Norwalk, Conn. 06851.

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Telecom's PBX in Japan

Mitsui to Distribute SL-1

NASHVILLE, Tenn. — Northern Telecom, a subsidiary of Northern Telecom, Inc., and Mitsui & Co., Ltd. of Japan have signed a long-term agreement under which Mitsui will distribute Northern Telecom's SL-1 series of private branch exchanges (PBX) in Japan.

The agreement will make Northern Telecom's SL-1 systems available in Japan for the first time. The two companies said they hope to establish a relationship with the Nippon Telegraph and Telephone Public Corp., the state-owned telephone company, and to sell SL-1 systems to Japanese end users directly and through subdistributors.

Mitsui, headquartered in Tokyo, is one of Japan's largest general trading companies. The SL-1 is Northern Telecom's mainstay in the PBX market, with over 5,000 systems installed worldwide.

Mergers & Acquisitions

Shareholders of both firms have approved plans for **Xerox Corp.** to acquire **Crum & Forster,** a property and casualty insurer with headquarters in New York. Xerox will pay $55 for each of Crum & Forster's 28.7 million outstanding shares of common stock.

Shareholders will have the choice of receiving cash or a combination of Xerox common and new Xerox preferred stock. Crum & Forster will become a Xerox subsidiary.

Honeywell, Inc. will acquire **Disc Instruments, Inc.** of Costa Mesa, Calif., from **Finnegan Corp.** through the purchase of all of Disc's common stock for $8 million in cash.

Datacrown, Inc., Toronto, has acquired **Shell Canada Ltd.'s** unit **Sheltech Micrographics,** a supplier of computer output to microfilm (COM) services. In a related agreement, Shell has signed a long-term contract with Datacrown for COM services.

Duke of Energy Corp., Dallas, Texas, has signed a letter of intent to acquire **Terminals Unlimited,** Falls Church, Va., for 3.5 million shares of Duke of Energy common stock valued at $21 million.

Parameter Driven Software Northwest, Inc., Beaverton, Ore., has purchased the **Burroughs Division** of **Timberline Systems,** also of Beaverton. Details of the sale were not disclosed.

SEI Corp. of Wayne, Pa., has acquired all the outstanding common stock of **TMI Systems Corp.,** Lexington, Mass., for $12 million in cash and stocks.

National Tel Data Corp. of Ann Arbor, Mich., has acquired **Infoserv, Inc.,** a Michigan-based telecommunications marketing and consulting firm.

Visual Technology, Inc., Tewksbury, Mass., has completed acquisition of **Ontel Corp.,** which is based in Woodbury, N.Y.

Evans Griffiths & Hart, Inc., Lexington, Mass., has purchased all of **Interactive Information Systems, Inc.'s** business interests in the ROSS/V software package.

ROSS/V was originally developed by Evans Griffiths & Hart under a joint business agreement with Interactive Business Systems and Online Data Processing, Inc. of Spokane, Wash. Online's participation in the product remains unchanged.

Nickels & Dimes

Mountain Computer, Inc. has received a total of $500,000 in venture capital from San Jose Capital Corp., San Jose, Calif., and PCF Venture Capital Corp., Burlingame, Calif.

$ $ $

Excelan, San Jose, Calif., has received venture capital funding from a group led by Bay Partners, Mountain View, Calif.; Dougery, Jones and Wilder, San Francisco; Hambrecht & Quist, San Francisco; and Ventech Partners, New York.

$ $ $

Anacomp, Inc. has signed a seven-year credit agreement with five banks for a total of $45 million. The banks are Chase Manhattan Bank, N.A. (acting as Agent Bank); Manufacturers Hanover Trust Co.; Bank of America National Trust and Savings Association; Lloyds Bank of California; and American Fletcher National Bank and Trust Co.

$ $ $

Advanced Micro Devices reported sales of $91.5 million for its third quarter, 1982, a 30% increase over the same period the previous year. Net income for the first nine months of the year resulted in earnings of 54 cents per share for stockholders, compared with nine-month earnings the previous year of 24 cents per share.

$ $ $

Rosscorp Corp., Cerritos, Calif., has secured $3 million in first-round funding from a consortium of venture capital firms led by Vista Ventures, Stamford, Conn. Other investors include Burr, Eagan and Deleage, San Francisco; Brentwood Associates, Los Angeles; and Whitehead Associates, Greenwich, Conn.

$ $ $

Drivetec, Inc., San Jose, Calif., has secured $3 million of equity funding. Investors include Hambro International Venture Fund, New York; Advanced Technology Ventures, Menlo Park, Calif.; and Bay Partners, Mountain View, Calif.

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Micom Systems, Inc. has reported a 51% increase in sales and earnings for the third period of fiscal 1982 over the corresponding period for the previous year.

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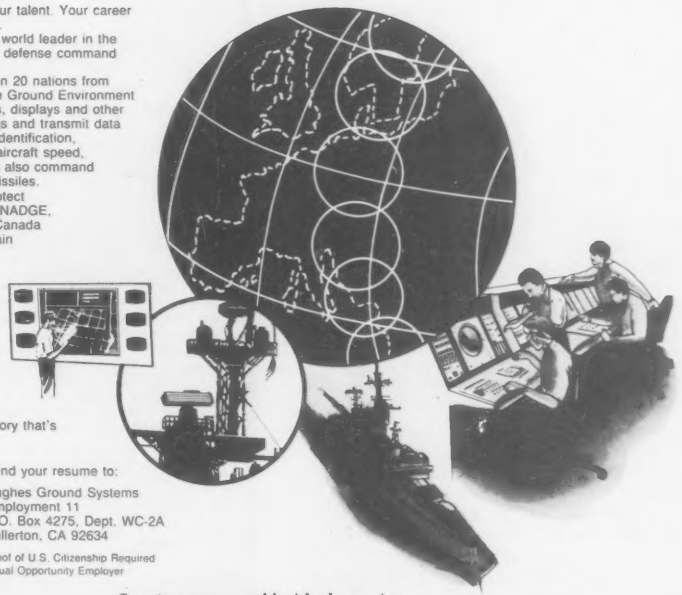

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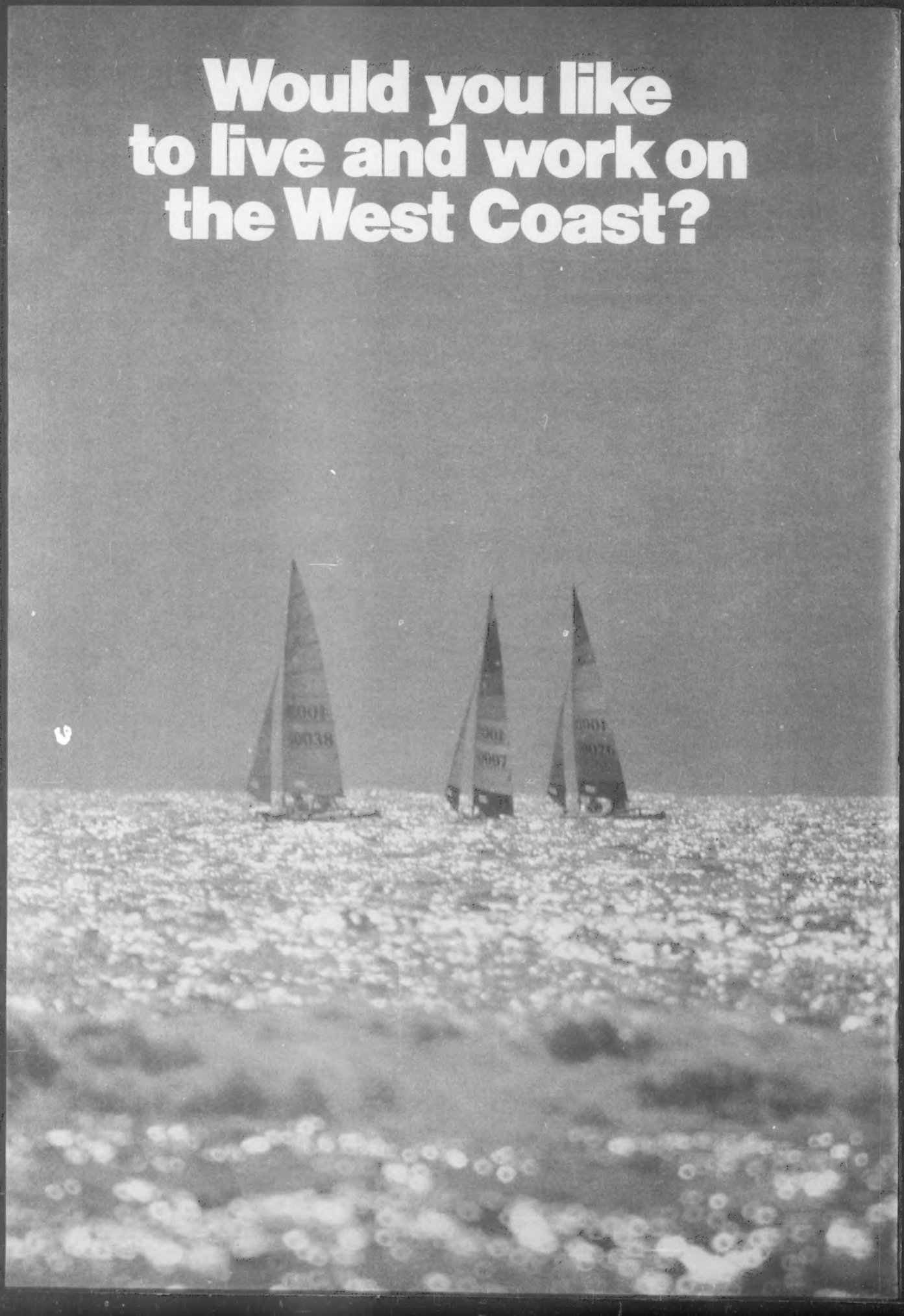

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Minicomputer Programmer/Analyst — Four Day Work Week. Progressive employee-oriented firm offers excellent benefits (including profit sharing and four day work week), and exposure to manufacturing systems. Successful candidate will have BASIC experience on minicomputers. Manufacturing applications and DEC PDP-11 or VAX helpful. To $26,500.

Director of Software Development — Ground Floor Opportunity. Join an up-and-coming microcomputer software development firm headquartered in the Pacific Northwest. A track record managing the development of micro based systems is required. The company is well financed and Stock Options are available. This is an exciting opportunity for an aggressive, entrepreneurial-minded professional. To $50,000.

Software Engineers — Many Opportunities. Highly-regarded Pacific Northwest organization has several real-time ASSEMBLER and FORTRAN software development projects to staff. Graphics, SCADA, VAX, SEL, CDC and/or microcomputer skills are preferred. Bachelor's degree required. To $40,000.

Programmer/Analyst — Management & CICS Training. Rapidly expanding Western Washington data processing organization seeks a professional having at least two years of IBM OS/COBOL and VSAM experience to work on financial information systems. Continued expansion provides excellent opportunities for upward mobility. To $30,000.

Systems Programmer — Alaska. Expanding Alaska firm offers state-of-the-art exposure to an experienced IBM OS Systems Programmer. The successful candidate will join the state industry leader while enjoying the unique advantages of our 49th State. CICS, MVS/JES sysgens, internals desirable. To $45,000.

Oregon

Sales Representative — Computer Manufacturer. Portland branch of very aggressive and expanding national minicomputer manufacturer seeks individual with 2-3 years successful track record in sales of computer hardware and/or software and with ability to work with top level management and decision makers. Will market complete product line including data processing and word processing systems to a wide variety of industries. To $50,000.

Programmer Analyst — Learn New Skills. New development with opportunity to learn IMS/DL1. Expanding department of strong Portland firm needs individual with minimum two years experience with CICS (Command Level) and COBOL. Will be key member of small project team and will have opportunity to learn IMS/DL1 on next project. Career growth opportunity. To $25,000.

Senior Programmer Analyst — State-of-the-art. Portland financial institution has new expansion position for a self-starter who has over four years strong COBOL and a minimum of one year experience with IMS data base. First project in this very progressive and state-of-the-art environment is as team member to implement a new Deposit System. Any exposure to on-line is a real plus. To $30,000.

Software Engineer(s) — Microprocessor(s). Newly-formed division of Portland firm that specializes in high reliability systems to support the industrial control/process control industry has urgent need for Software Engineer to develop application software. Desire individuals with good knowledge and experience with software development communications, I/O drivers and Operating Systems on microprocessors. Dynamic, young company. To $38,000 + stock options.

Software Engineer — Operating Systems Designer. Exciting young firm in Portland offers unique opportunity to develop sophisticated microprocessor operating systems software. Position involves leading several junior engineers in designing and developing operating systems for high reliability/redundant industrial control applications utilizing microprocessors. A strong background in operating systems development on microprocessors is required. To $45,000.

Systems Programmer — Micros and Unix O/S. Excellent opportunity for individual with heavy background with the Unix operating system and microprocessor software to develop and enhance in-house developed operating system to support intelligent communication terminals and word processing systems. Oregon company emphasizes research and development of new products to support both products. Growth-oriented firm. To $40,000.

DB Analyst — Growth to Administrator. Young and rapidly growing Portland firm has requirement for individual to support IDMS data base activities. Duties will include physical and logical data base design, applications development consulting, data base maintenance, data base tuning, user training, etc. Excellent opportunity for growth to the DB administrator's position. To $34,000.

Senior Network Systems Programmer — Will Lead to Management. Growth opportunity in state-of-the-art Portland shop for individual to be integral part of team responsible for total corporate network (includes international). Requires solid background with IBM Networks (VTAM, NCP, NCCF, NPDA, etc.) with exposure to other protocols a real plus. Desire individual who is a good problem solver. Opportunity for management. To $37,000.

Programmer/Analyst — Minicomputers. New development group has recently created expansion positions for several enthusiastic Programmer Analysts with solid background in BASIC language and the PICK operating system. Will develop new on-line applications for Order Entry and Inventory on minicomputers and then will support field installation of these systems. Company provides a very creative environment in Portland. To $28,000.

Senior Systems Analyst — Manufacturing Systems. Unique opportunity to function as a project leader on the design and development of new on-line and data based manufacturing/engineering systems. Seek an individual with good IMS design and development background and previous project leadership experience. Excellent career growth opportunity for an individual to grow into first level management. To $33,000.

Systems Programmer — CICS Specialist. Join this aggressive Portland firm's staff of technical support specialists and be responsible for the majority of CICS system programming activities. Will also be involved in MVS maintenance and enhancement and will be given opportunity for additional work and training in supporting DL/1, Performance monitoring, Capacity planning, etc. Requires solid experience with MVS and CICS systems programming activities. To $36,000.

Northern California

Systems Programmer — Superb Location. National financial computer service company is looking for an experienced OS/MVS Systems Programmer to support their growing IBM 3033 facility in the beautiful San Joaquin Valley. To $40,000.

Telecommunications Specialist. Join a rapidly expanding national computer network using Tandem front end processors and IBM hosts. Experience required with IBM SDLC and Tandem TAL. To $40,000.

Manager of Network Architecture. Nationally-known San Francisco Bay area based firm with extensive TP network. Responsible for network planning, installation, and support from controllers out. Must have large IBM experience. To $50,000.

Systems Programmer. Leading San Francisco based firm seeks a proven OS/MVS Systems Programmer experienced with MVS Internals, Tuning, and Capacity Planning. To $38,000.

Internal Consultant — IDMS. Progressive Bay area firm located in a highly desirable suburb seeks a proven Systems Analyst with an extensive background in Systems Development using IDMS. To $40,000.

Project Leader — New Development. Major San Francisco financial institution seeks a proven Programmer/Analyst to lead the development of an Electronic Funds Transfer System in an IBM/OS environment using CICS. To $39,000.

Data Base Administrator — Prestigious Firm. Silicon Valley manufacturer offers an excellent opportunity for an experienced IMS Data Base Administrator familiar with the Data Communication facility. To $43,000.

Systems Analyst — Large System Environment. National consumer electronics firm seeks a proven Systems Analyst with strong manufacturing and accounting experience in a large IBM/OS environment. To $36,000.

National Sales Director. International firm located in San Francisco seeks proven Software salesperson to introduce new relational data base package and establish national accounts. Compensation will be structured to the individual. To $80,000.

Software Manager — Major Responsibility. San Francisco area division of Fortune 500 Corporation seeks shirtsleeves leader of real-time interactive Software group. Technical degree and at least 10 years of progressive development responsibility sought. To $50,000.

Project Leader — Southern Peninsula. Senior level software engineer to lead mini/micro operating systems development team for new 32 bit processor. Requires 5 years software development with specific operating systems experience. **Salary to $55,000 and equity potential.**

Software Engineer — Fast Growth. Leading San Jose-area growth company seeks Microprocessor software professional to develop systems for the Communications industry. Experience with Assembler and PASCAL. To $45,000.

Southern California

New Corporate Data Center — Orange County. Fortune 500 organization is undergoing a major expansion and is in the process of centralizing all systems planning, programming software and computer operations into a new corporate data center. The center, which is located in a highly desirable suburban Orange County area, will house the latest in IBM computer hardware and software technology including advanced data base telecommunications and distributed processing applications. Current openings include Programmer/Analyst, Systems Analysts, Project Managers, EDP Auditors, System Programmers and Hardware/Software Planners. **Starting salaries range to $35,000.**

MI Director — New Data Center. Progressive firm in the electronics industry seeks a proven Manager capable of building a data processing organization from the ground floor. Will select equipment, hire staff and set direction for successful and growing firm. Suburban Los Angeles community. To $45,000.

EDP Audit Specialist — Extensive In-House Training. Fortune 500 organization headquartered in Southern California seeks an EDP Audit Specialist experienced in designing accounting applications in an IBM OS environment. Training in auditing techniques and advanced computing provided. To $39,000.

Sales Representative — High Income. Orange County office of a leading computer manufacturer is seeking a Marketing Representative with a proven track record of selling business systems. **The average income of its sales force last year was over $50,000.**

Programmer/Analyst — Learn Data Base. Growing Los Angeles energy company seeks OS/COBOL Programmers who want to learn IMS and manufacturing applications. Presently developing new IMS systems for plant and building maintenance and shop floor scheduling. To $35,000.

Software Development — Minicomputers. Successful Orange County minicomputer manufacturer seeks professionals with operating system computer data communications, data base or microprogramming experience. Company is committed to developing and sustaining a complete line of state-of-the-art systems software products. To $40,000.

COBOL Programmer — Newport Beach. Well-known diversified financial services firm seeks a professional with a minimum one year COBOL programming experience. Outstanding work environment overlooking Pacific Ocean. CICS, MVS training provided. To $36,000.

Programmer/Analysts — San Fernando Valley. Major financial institution located in a desirable suburban setting north of Los Angeles needs both mini and large systems Programmer/Analysts. The organization provides excellent benefits including an exceptional benefits package. To $34,000.

FORTRAN Programmer — Business Systems. Fast-growing Los Angeles suburban financial firm seeks a professional with FORTRAN experience. Company is installing dual computers for on-line transaction-driven systems. To $32,000.

On-Line Project Leader. Reorganization of an established data processing group provides a major growth opportunity for a current Senior Analyst. Excellent location, near ocean and Los Angeles airport. Will direct 2 to 5 Analysts in the installation of a major on-line manufacturing system using IMS DB/DC. To $35,000.

Minicomputer Programmers — World-Wide Network. Prestigious organization near Santa Monica beach seeks experienced, on-line real-time Minicomputer Programmers to participate in the development of a world-wide financial communication network. To $40,000.

Consultants — Big "8" Prestige. Los Angeles practice of a major Big 8 firm is committed to significant expansion in 1983. Excellent opportunities for senior level professionals with background in manufacturing, financial or administrative systems. To $50,000.

Minicomputer Programmer — San Diego Suburb. Division of a Fortune 500 corporation seeks a Programmer Analyst proficient in any high-level language (e.g., FORTRAN, PL/1, ALGOL, or PASCAL) to work on a variety of minicomputers (including PDP-11 and HP computers). To $32,000.

On-Line Programmers — OS Environment. Major San Diego based organization has several openings for On-Line Programmers to participate in a system utilizing a large network of terminals tied to one of IBM's latest computers. Selected candidates will work in an OS/MVS CICS, IMS environment. To $35,000.

Senior Minicomputer Systems Programmer. Manufacturing company headquartered in San Diego has a requirement for an experienced PDP-11 Programmer who has worked on RSX-11M. Will be involved in a major effort to develop a state-of-the-art real-time system. To $32,000.

Graphics Programmer/Analysts. One of San Diego's premier graphics software firms has several positions available for individuals with a background in FORTRAN. To $32,000.

MVS Systems Programmer. Large San Diego based organization seeks a professional to assist in the upgrade to MVS utilizing multi-CPU's and a large network of terminals. The company is one of the most stable organizations in the San Diego area, yet one of the most progressive in keeping up with state-of-the-art technology. To $39,000.

Multiple Career Path Opportunities. Major San Diego high technology organization with multiple large-scale computer systems, minicomputers and microprocessors is currently expanding its professional data processing staff due to projected business growth. Current requirements include Business and Scientific Applications Programmers with a proficiency in COBOL, ALC or FORTRAN; Systems Programmers with experience in OS/VS2/MVS, IMS or telecommunications; and Business and Scientific Systems Analysts to develop new systems utilizing structured design and IMS. **Salaries range from $20,000 to $35,000.**

IBM Systems Programmer — Customer Support. A national computer manufacturer is seeking several additional Systems Programmers to staff their growing San Diego facility. Individuals with experience in IBM DOS or OS operating systems preferred. To $35,000.

Financial Systems Analyst. Rapidly expanding financial institution is seeking a computer professional with systems analysis ability who has served as a Project Leader. Experience in on-line systems in IBM COBOL and Assembler environment is highly preferable. Facility is located in one of the most beautiful sections of San Diego. To $30,000.

RPG II Programmer — Learn RPG III. International transportation company seeks an experienced RPG II Programmer. Will gain experience in RPG III on a S/38. To $25,000.

Micro Programmer Analysts — Leading Firm. San Diego based company, a leader in its field, needs Assembly Language Programmers to work in video graphics, real-time software and software utility development. To $35,000.

PASCAL Programmer/Analyst — Process Control. Opportunity for experienced PASCAL Programmer to work on real-time process control applications for software development firm in San Diego. To $33,000.

Communications Specialist — Multiple Openings. San Diego office of national consulting firm needs experienced software people to work on secure communications systems. To $40,000.

Data Processing

MANAGEMENT INFORMATION SYSTEMS OPPORTUNITIES

Anheuser-Busch Companies, the nation's #1 name in beer, is seeking experienced individuals for it's Management Systems Department located in the corporate headquarters based in St. Louis, Missouri.

MANAGEMENT RESEARCH ANALYST

Duties will include participation in a variety of projects to design, program and implement enhancements to existing management science-based systems. You will also research the feasibility of new or advanced O/R-based techniques for specific departments where present applications are limited. The opportunity to develop new O/R-based analytical and decision support systems also exists.

The ideal candidate will possess a technical or engineering degree. An MBA, with emphasis in the management sciences — including linear programming, simulation and statistics/regression analysis is required. Applicants will have several years' experience in an industrial setting developing and implementing systems based on management science techniques.

SYSTEMS ANALYST

Duties will include in-depth involvement in the analysis, development and implementation of computerized solutions for company business issues. The Systems Analyst will develop, analyze and design reports, detail a system work plan, implement the system solution under the direction of the project manager. You will be working with various department managers, so good written and verbal communications skills are a must.

The ideal applicant will possess a BS degree in Data Processing or Business, MBA preferred. Candidates will have 1-2 years' experience in system design, prior programming experience with 2-4 years' exposure to Data Processing with 1 year of emphasis in systems analysis.

We offer an excellent salary and a complete company paid benefits program including dental plan. Interested and qualified applicants, please send your resume, educational and salary history in confidence to: ANHEUSER-BUSCH COMPANIES; Corporate Employment; Department G-31-LB-CW; One Busch Place; St. Louis, Missouri 63118. An Equal Opportunity Employer M/F.

ANHEUSER-BUSCH COMPANIES

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The 536 bed university hospital is seeking a Systems Analyst to function as a member of our Systems Development Staff for the installation of our new Patient Care System. We are installing the SMS ACTION 2000 System which utilizes an IBM 4341, a Series/1, and 3279 color terminals.

Major duties involve problem-solving with members of the admitting, operating room, medical records, and nursing staff as well as screenbuilding in a high level command language on the system.

Candidates should have strong communications and interpersonal skills. An undergraduate degree is required. Previous experience with hospital systems and procedures is preferred.

Benefits include one month vacation, excellent medical benefits, and tuition reimbursement. Courses are available on campus in the Center For Advanced Study in Health Care Fiscal Management, Organization and Control. Salary commensurate with training and experience. Send resume to:

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Director, Information Systems
UNIVERSITY OF WISCONSIN HOSPITAL & CLINICS
600 Highland Ave.
Madison, WI 53792

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The successful candidate will possess a BS/MS in Business, OR, ComSci or equivalent with 10 or more years experience in the development of computer-based systems in finance, MIS and business operations, with 3 or more years demonstrated experience in managing the development of major systems. Consulting experience helpful.

We offer competitve compensation; paid relocation, excellent benefits and a location offering excellent cultural, academic and recreational opportunities. RESPOND TODAY! Send your resume and salary history to Mr. Larry Brown at:

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We are a progressive, high technology manufacturer located in central South Carolina. The successful Programmer/Analyst candidate will have 3-5 years industrial manufacturing experience with proficiency in FORTRAN on super mini-computers. Exposure to process control applications and SEL is preferred.
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CAPACITY Planning Software/Hardware comm.....$55M+
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PROJ MGR Tcam/Cics alp SOM, staff 4 new system dev.....$51M
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CICS OD Idms trade sys dev.....$45M
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Manage a new, select group of application sales specialists for an established Wang Human Resource Management System including payroll, personnel, and benefits management. Marketed on a national basis in conjunction with the Wang national sales organization, these products will be utilized by large Fortune 1000 organizations. Requires a minimum of 7-10 years' sales and management experience within a major account environment demonstrating substantial experience in Human Resource Application area.

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Salary will be in the low 20's, excellent benefits include tuition reimbursement and we offer outstanding potential for advancement. Apply by sending resume with salary history, in confidence, to: Paul Antony, Professional Employment,

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SYSTEMS ANALYST

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We are seeking a professional with solid management experience in publishing or a related business to head up our new publication. The qualified applicant must be bilingual (Arabic/English). Knowledge of computer, DP, or electronics industry desirable.

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This position requires a professional with editing experience in technical publishing and a strong background in editorial department management. Your responsibilities will include accurate editorial content, manuscript acquisition and quality, writing headlines, directing the design of editorial pages, and meeting production deadlines. You must be bilingual (Arabic/English).

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Ford

Ford Aerospace & Communications Corp.
Aeronutronic Division

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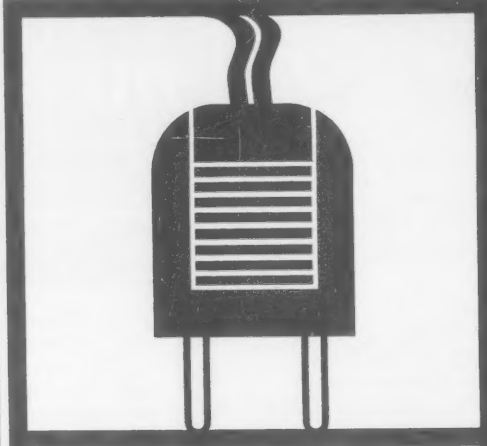

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  (2-10 yrs exp)
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A growing diversified manufacturing co. located in Knoxville, TN has a position in its DP department for an innovative professional. Candidate must possess:
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Manufacturing background a must. (COPICS experience a definite plus.)
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- At least 1 year as a project leader
- ACP and data base experience a plus
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Compass offers excellent salary and benfit package. **Please send resume to: Victoria G. Dahl, Compass Computer Services, Inc., 7701 Stemmons Freeway, Ste. 540, Dallas, TX 75247.**

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NATIONAL

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Requires BS in Computer Science, 1 year interactive COBOL, 2 years as analysis or project leader, 1 year supervision, prefer municipal and DG experience. Starting salary $22,942-$26,540. Excellent benefits.
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By 3/4/83
AA/EOE

SYSTEMS ANALYST. Design & implement computer systems rltd to financial insts. Maintenance & enhancement of systems & provide vital skills ensuring their successful & cost effective operation. B.Sc. or equiv. in ComSci/DP/Math/Physics. Must have knowledge of COBOL, ASSEMBLER, & CICS. 2 yrs or 2 yrs programming. $538.50 per wk to work 40 hrs/5 days/wk. **PLEASE SEND RESUMES: Pinkerton Computer Consultants, Inc. 111 Broadway, NYC 10006**

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Install application software at field locations, supervising 1-2 project team members. Train user department personnel. Installation and training experience desirable. Travel required.

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Require a strong DP orientation and a sound knowledge of business concepts for the manufacturing, finance and banking industries. Specific requirements include a thorough knowledge of several of the following technologies: current computer architecture, CAD/CAM, image processing and microprocessors. Knowledge of IBM operating systems, computer capacity management and disaster recovery would be a significant bonus. The ability to handle project management and software design assignments is essential.

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Require extensive 5-10 years of telecommunications experience, particularly in the application of voice and data communications technology. Background should include significant exposure to network and integrated communication systems design. User oriented assignments range from office automation projects through the planning of multifunctional international telecommunications networks. A second major area of emphasis involves the evaluation and recommendation of major policy directions for technological, regulatory and pricing issues in the provision of telecommunications service and products.

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DIRECTOR SOFTWARE DEVELOPMENT

INFORMATION SYSTEMS

Mead Data Central is a leading provider of on-line, full text information retrieval services to subscribers nationwide in the legal and professional markets. Our Headquarters and Corporate Computer Center are located in the Dayton-Cincinnati area.

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To be considered, you must have:

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  - Operating systems languages
  - Data base structures
  - Language processors
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You will be managing and working on complex, highly efficient on-line information retrieval systems. Your previous experience should be involved with remote computing software or services as opposed to internal Data Processing or MIS systems. This position reports directly to the V.P. Systems and Operations. You will be working with a top management team that is totally committed to and directly involved with implementation of computer-based information systems and with state-of-the-art hardware, software and systems technology.

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Human Resources
Mead Data Central
P.O. Box 933
Dayton, OH 45401

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Background in several of the following areas in a manufacturing product-oriented environment desirable: design of realtime executives, sound and voice synthesis (digital signal processing), interactive graphics, geometric modeling, experience on 16-bit microprocessors.

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Application deadline March 11, 1983. Please send letter of application, resume, unofficial transcripts and the names of three references to **Dr. Martin Gonzalez, Head, Division of Business and Economics, Mississippi University of Women, Columbus, MS 39701.** An EO/AA employer.

Computer Services: The University of Arkansas at Little Rock is a dynamic urban university serving 10,000 students in the financial industrial and governmental center of the state. Rapidly expanding computer sciences program requires faculty at all levels. Successful candidates will teach undergraduate computer science classes and contribute to the development of a master's level curriculum. Ph.D. in Computer Science preferred but appropriate work experience combined with formal education will also be considered. Commitment to teaching essential. Starting date: August, 1983. Vita and three letters of recommendation to: **Dr. Alan M. Johnson, Department of Mathematics and Computer Science, University of Arkansas at Little Rock, Little Rock, Arkansas 72204.** *An EEO/AA Employer.*

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Principal Programmer/Analyst
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University of Colorado
Human Resources Department
C.B. 475
Att.: Bruce Badger
1511 University Ave.
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(303)492-6475

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The deadline for classified advertising is ten days prior to the issue desired. (That's six working days prior to the issue date). Ads may be sent in by mail. For camera-ready ads, a velox or negative is required. For ads to be typeset by us, enclose a layout if needed, along with any logos or artwork you would like to include in the ad. These must be dark and clear for reproduction purposes.

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If you wish a box number to be assigned to your ad, it will cost an additional **$15.00.**

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- **VAX/VMS software development**
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You'll work in an environment ranging from the DEC-20 to the IBM PC, using the whole spectrum of software engineering tools including cross-compilers, programs implementing file transfer protocols, symbolic debuggers, software documentation tools, etc.

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M/A-COM

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SYSTEMS PROGRAMMING
- Honeywell-DPS/8
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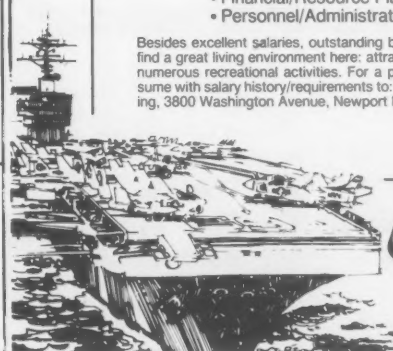

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SYSTEMS PROGRAMMER SUNBELT LOCATION

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The individual for this position should have at least 1 year's experience as a Systems Programmer and have strong design, organization and documentation skills. Knowledge of the DOS/VSE operating system and CICS is a plus for this position. The ability to communicate effectively, both verbally and in writing, with our vendors, clients and operations personnel is mandatory.

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Vice President, Systems & Programming
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Greenville, S.C. 29606
Phone: (803) 235-8500

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Dynamic, rapidly growing established company seeks a talented individual to create software solutions for our client's challenging data processing requirements.

Required background includes expertise in Cobol (Pascal is a plus) and experience with on-line data base applications preferably on the Texas Instruments 990.

Base salary of $38,000, full corporate benefits and performance incentive bonuses. This position requires a hands on creative professional; management types need not apply. **CW-B4080, Computerworld, Box 880 Framingham, MA 01701**

Please submit resumes to President.

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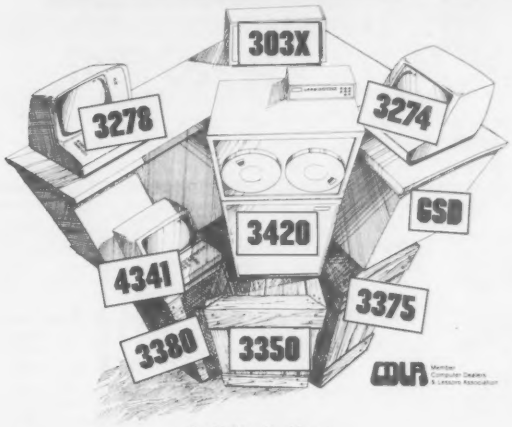

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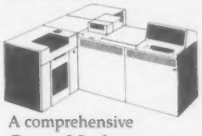

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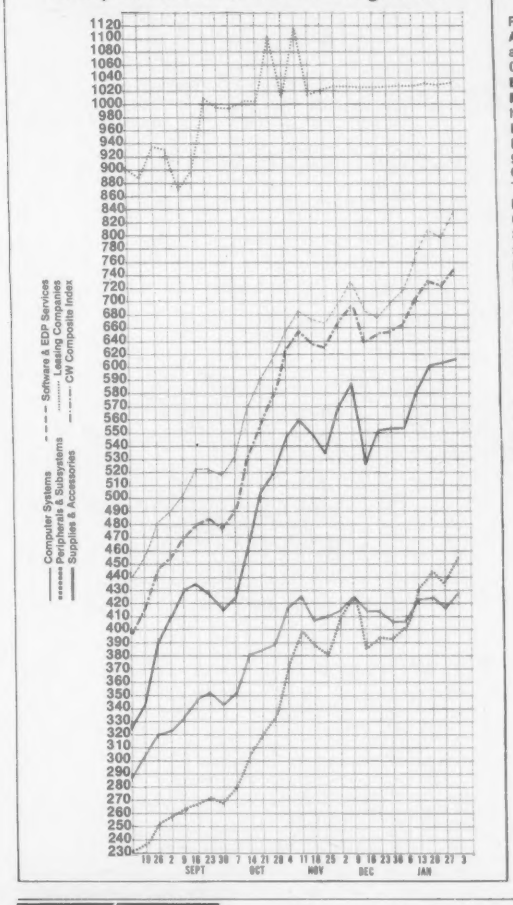

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Computerworld Stock Trading Summary

TRADE QUOTES

CLOSING PRICES WEDNESDAY, FEBRUARY 2, 1983

All statistics compiled, computed and formatted by TRADE QUOTES, INC. Cambridge, Mass. 02139

E X C H		1982-83 RANGE (1)	CLOSE FEB 2 1983	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
A	AMDAHL CORP	17- 36	36	+4 1/4	+13.3
N	BURROUGHS CORP	28- 48	43 1/4	-3 1/8	-6.7
O	COMPUTER AUTOMATION	7- 17	13 7/8	- 1/8	-0.8
N	CONTROL DATA CORP	21- 45	42 3/4	+ 7/8	+2.0
N	CRAY RESEARCH INC	20- 45	42 3/4	+2 1/4	+5.5
N	DATA GENERAL CORP	20- 59	46 7/8	+1 3/8	+3.0
N	DATAPOINT CORP	11- 54	20 3/4	- 1/2	-2.3
N	DIGITAL EQUIPMENT	62-122	118 1/4	+2 3/8	+2.0
A	ECCO INC	6- 11	8 3/4	- 1/8	-1.2
N	ELECTRONIC ASSOC.	5- 12	10 1/8	- 1/4	-2.4
N	FLOATING POINT SYST	16- 35	32 7/8	- 3/8	-1.1
N	FOXBORO	22- 40	36 1/4	- 1/8	-0.3
O	FULCRUM COMP GRP	1- 3	1/4	0	0.0
O	GENERAL AUTOMATION	3- 8	6	+ 1/8	+2.1
N	HARRIS CORP	20- 43	40 7/8	+3	+7.8
N	HEWLETT-PACKARD CO	38- 82	78 5/8	+1 1/4	+1.6
N	HONEYWELL INC	60-104	87 3/4	-1	-1.1
N	IBM	48-100	98	+ 7/8	+0.9
O	IPL SYSTEMS INC	5- 9	6 3/4	- 1/4	-3.5
O	MAGNUSON COMP SYSTS	2- 18	2	- 5/8	-23.8
N	MANAGEMENT ASSIST	7- 18	15 3/8	+3 1/2	+29.4
O	MINI-COMPUTER SYST	1- 4	5/8	0	0.0
N	MODULAR COMPUTER SYS	6- 13	11 7/8	+ 1/2	+4.3
N	MOHAWK DATA SCI	10- 18	16 1/8	+ 1/2	+3.1
N	NCR	38- 95	93 1/2	+2 1/2	+2.7
N	PERKIN-ELMER	17- 33	31 3/8	+1 1/8	+3.7
N	PRIME COMPUTER INC	16- 42	40 3/4	+1	+2.5
N	SPERRY CORP	21- 38	37 1/2	+2	+5.6
O	TANDEN COMPUTERS INC	14- 34	28 1/2	+ 3/8	+1.3
N	TEXAS INSTRUMENTS	71-176	168 1/2	+6 3/4	+4.2
A	WANG LABS "B"	13- 35	32 1/8	- 1/2	-1.5
A	WANG LABS "C"	11- 34	32 1/8	- 7/8	-2.6
	LEASING COMPANIES				
O	BOOTHE FINANCIAL CP	22- 30	28 1/2	0	0.0
N	COMDISCO INC	13- 46	43 1/2	+ 1/4	+0.5
B	COMMERCE GROUP CORP	1- 1	1/4	0	0.0
O	COMPUTER INVSTRS GRP	1- 2	3/8	0	0.0
O	CONTINENTAL INFO SYS	5- 20	17 3/4	+1	+5.9
N	DPF INC	5- 13	10 5/8	0	0.0
O	ITEL	1- 5	3/4	+ 1/8	+20.0
O	LEASPAC CORP	1- 2	1/8	0	0.0
N	U.S. LEASING	18- 40	39 1/2	+1 3/4	+4.6

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH; B=BOSTON
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

E X C H		1982-83 RANGE (1)	CLOSE FEB 2 1983	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 6	3 1/2	+ 1/4	+7.6
O	ADVANCED SYSTEMS INC	9- 22	21 1/4	+ 1/4	+1.1
O	AGS COMPUTERS INC	7- 20	18 1/4	+ 3/4	+4.0
N	ANACOMP INC	9- 18	18	+ 1/4	+1.4
O	ANALYSTS INTL CORP	5- 8	8 1/2	+ 3/4	+9.6
A	APPLIED DATA RES.	16- 44	43 1/2	+3 1/2	+8.7
O	ASK COMPUTER SYSTEMS	12- 30	29 5/8	+4 7/8	+19.6
A	ASTRODYNE COMP IND	1- 5	3 7/8	+ 3/4	+24.0
N	AUTOMATIC DATA PROC	21- 38	33 1/2	-1 1/2	-4.3
O	CGA COMPUTER ASSOC	5- 12	11 1/4	0	0.0
O	COMPUTER ASSOC INT'L	12- 43	43 1/4	+3 3/4	+8.4
O	COMPUTER HORIZONS	1- 3	3 1/4	- 1/4	-2.6
O	COMPUTER NETWORK	4- 9	7 1/8	+ 3/8	+5.5
N	COMPUTER SCIENCES	11- 21	19 7/8	+2 5/8	+15.2
O	COMPUTER TASK GROUP	8- 18	15 1/4	+1 1/2	+10.9
O	COMPUTER USAGE	2- 10	9 1/4	- 1/2	-5.1
O	COMPUTONE SYSTEMS	13- 30	29	+2 1/2	+9.4
O	COMSERV CORP	11- 20	18	-1	-5.8
O	CONSHARE	6- 10	8 5/8	0	0.0
N	CULLINET SOFTWARE	12- 35	31 1/4	+ 1/4	+0.8
O	CYCARE SYSTEMS INC	9- 18	18	+1 1/4	+8.4
O	DATA DIMENSIONS INC	1- 3	1/4	0	0.0
O	DATATAB	0- 4	3/4	+ 1/8	+20.0
O	DYATRON CORP	2- 4	3 1/4	+ 1/4	+8.3
N	ELECTRONIC DATA SYST	19- 50	46 1/4	-1 1/8	-2.3
O	INFORMATICS INC	10- 25	25 1/4	+3	+13.4
O	INSYTE CORP	1- 3	2 3/8	+ 1/8	+5.3
O	IPS COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	4- 8	7	+ 1/4	+3.7
A	LOGICON	12- 31	29 7/8	+ 1/8	+0.4
O	MNGT SCI AMER INC	8- 28	27 1/4	+4	+17.2
O	MATHEMATICA INC	12- 20	18 1/2	+1	+5.7
O	MATHEMATICAL APP GRP	12- 19	18 1/2	0	0.0
O	NATIONAL DATA CORP	13- 26	19 3/8	+2	+11.5
O	PANSOPHIC SYSTEMS	8- 21	20 1/2	+ 1/4	+1.2
N	PLANNING RESEARCH	6- 13	12 1/2	+ 5/8	+5.2
O	PROGRAMMING & SYS	1- 4	3 7/8	+ 3/8	+10.7
O	REYNOLDS & REYNOLD	17- 36	35 1/2	+1 1/4	+3.6
O	SEI CORP	21- 49	48 3/4	+8 1/4	+20.3
O	SHARED MEDICAL SYST	13- 28	26 5/8	+1 1/2	+5.9
O	SCIENTIFIC COMPUTERS	8- 13	11	+ 1/4	+2.3
O	SOFTWARE AG	5- 17	11 1/2	+1 1/4	+12.1
N	TYMSHARE INC	12- 30	20 5/8	- 7/8	-4.0
A	URS CORP	10- 20	18 1/8	- 7/8	-4.6
N	WYLY CORP	7- 13	10	- 7/8	-8.0
	PERIPHERALS & SUBSYSTEMS				
N	AM INTERNATIONAL	1- 15	2 5/8	+ 1/8	+7.5
A	ANDERSON JACOBSON	8- 26	22 1/4	+1 1/8	+5.3
O	AUTO-TROL TECHNOLOGY	8- 19	17 1/4	+2 1/8	+14.0
O	BANCTEC INC	7- 33	18 1/2	+1 1/2	+8.8
A	BEEHIVE INT'L	4- 10	8 3/4	+ 3/8	+4.0
A	BOLT-BERANEK & NEW	9- 35	34 5/8	0	0.0
O	CAMBEX CORP	2- 4	2	0	0.0
N	CENTRONICS DATA CORP	6- 17	17 1/8	+3 1/4	+23.4
A	CETEC CORP	4- 7	8 7/8	+ 3/4	+12.2
O	COGNITRONICS	2- 12	10 1/4	- 5/8	-5.7
O	COMPUTER COMMUN.	1- 2	3/4	0	0.0

E X C H		1982-83 RANGE (1)	CLOSE FEB 2 1983	WEEK NET CHNGE	WEEK PCT CHNGE
A	COMPUTER CONSOLES	15- 44	41 1/2	+1 1/8	+2.7
O	COMPUTER DEVICES INC	4- 21	13 1/4	+ 7/8	+7.0
O	COMPUTER TRANSCEIVER	4- 8	7 3/4	+ 3/4	+10.7
N	COMPUTERVISION CORP	19- 41	40 3/8	+2 3/8	+6.2
N	CONRAC CORP	21- 36	34 1/4	+1 3/4	+5.3
A	DATA ACCESS SYSTEMS	2- 5	1 1/8	+ 3/8	+50.0
A	DATAPRODUCTS CORP	16- 40	39	+3	+8.3
A	DATARAM CORP	5- 12	11 3/8	+ 5/8	+5.8
O	DATUM INC	2- 9	8 1/2	+ 3/8	+4.6
O	DAVID JAMISON CARLYL	2- 7	3 3/4	+ 1/8	+3.4
O	DECISION DATA COMPUT	3- 14	13 5/8	+2	+17.2
O	DELTA DATA SYSTEMS	1- 3	1 7/8	- 1/4	-11.7
N	ELECTRONIC M & M	5- 8	8 1/4	0	0.0
O	EVANS & SUTHERLAND	16- 48	45 3/4	+1	+2.2
O	GANDALF TECHNOLOGIES	10- 22	15 7/8	+1 1/4	+8.5
N	GEN'L DATA COMM IND	6- 19	18	+ 1/8	+0.6
O	GENERAL TERMINAL CP	0- 4	5/8	0	0.0
O	GREAT SOUTHWEST IND	2- 9	3	- 1/2	-14.2
N	HAZELTINE CORP	22- 48	47 5/8	+7 5/8	+19.0
O	ICOT CORP	3- 9	8 5/8	+1	+13.0
O	INFORMATION INTL INC	10- 22	19	+1 1/4	+7.0
O	INTEL CORP	21- 46	43 1/2	+2 1/4	+5.4
O	IPL SYSTEMS INC	5- 9	6 3/4	- 1/4	-3.5
A	LUNDY ELECTRONICS	7- 15	14 1/2	+1 3/4	+13.7
A	MSI DATA CORP	14- 36	24 7/8	-8 7/8	-26.2
O	NETWORK SYSTEMS CORP	15- 42	38 3/8	+3	+8.4
O	OMEX	3- 8	3	0	0.0
N	PARADYNE CORP	24- 50	41 1/8	-1 5/8	-3.8
A	PENRIL CORP	7- 12	10 1/4	+ 1/2	+5.1
O	RAMTEK CORP	12- 22	20	- 1/2	-2.4
N	RECOGNITION EQUIP	4- 12	11 3/4	+1	+9.3
O	SCAN DATA	1- 5	1 3/8	+ 1/8	+10.0
N	STORAGE TECHNOLOGY	16- 40	22 1/8	-1 3/8	-5.8
O	SYKES DATATRONICS	6- 24	13 5/8	+ 1/8	+0.9
A	T BAR INC	7- 13	12 3/4	+1 1/2	+13.3
A	TEC INC	4- 12	9 3/8	+ 5/8	+7.1
N	TEKTRONIX INC	34- 68	66 1/4	+1	+1.5
N	TELEX	5- 27	23 1/2	-1 5/8	-6.4
O	TESDATA SYSTEMS CP	3- 10	8	+ 1/4	+3.2
A	TIMEPLEX INC	7- 24	21 3/4	- 1/8	-0.5
O	VISUAL TECHNOLOGY	9- 19	17 3/4	0	0.0
O	WILTEK INC	1- 3	1 3/4	0	0.0
	SUPPLIES & ACCESSORIES				
N	AMERICAN BUS PRODS	11- 19	18 3/8	+ 1/4	+1.3
O	BALTIMORE BUS FORMS	1- 2	1 1/4	0	0.0
N	BARRY WRIGHT	13- 22	18 7/8	0	0.0
O	CYBERNATICS INC	1- 1	1	+ 1/8	+14.2
A	DUPLEX PRODUCTS INC	12- 20	17 3/4	- 1/4	-1.3
N	ENNIS BUS. FORMS	16- 30	26	+ 1/2	+1.8
N	3M COMPANY	49- 80	75 3/4	+1 3/4	+2.3
N	MOORE CORP LTD	26- 44	42 3/4	+ 1/2	+1.1
N	NASHUA CORP	9- 19	10 3/8	- 3/8	-3.4
O	STANDARD REGISTER	32- 72	66 1/2	+5 1/2	+9.0
A	TAB PRODUCTS CO	12- 32	31 3/4	+3 3/8	+11.8
N	WALLACE BUS FORMS	22- 51	50	+ 5/8	+1.2

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